

IMPACT OF AN ENRICHMENT PROGRAMME TO FOSTER CREATIVITY  
AMONG ACADEMICALLY GIFTED ELEMENTARY SCHOOL CHILDREN

By

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## ABSTRACT

The present study was aimed at determining the impact of Enrichment on the mean creativity gain levels of elementary school students.

With reference to 1. Age 2. Sex 3. Ordinal Position

The sample consisted of gifted children consisting of

20 children in age group 7-8 years

30 children in age group 9-10 years

20 children in age group 11-12 years

These children were identified from schools belong to Laddas City.

The tools need for the study more:

1. Weschsler Intelligence Scale for Children - an individual intelligence test. This test was used to identify gifted children on an individual basis in terms of their intelligence quotients.
2. The Wallach and Kogan battery of Creativity Instruments adopted by Parmesh (1971) was used to assess the creativity levels of gifted students before and after enrichment.
3. The Enrichment Experiment to foster creativity in gifted students was administered for a period of 45 days. The activities were planned on the basis of J.P. Guilford's Divergent Thinking Skills. The results were assessed by using the Wallach and Kogan Battery of Creativity Instruments.







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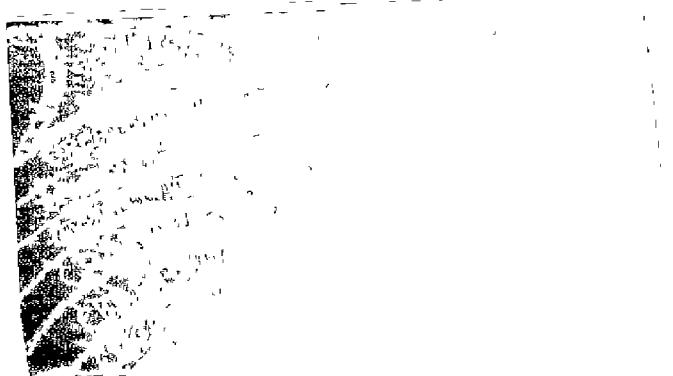
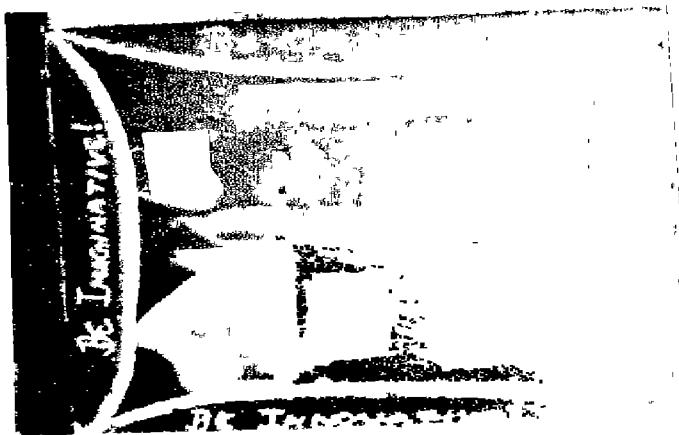
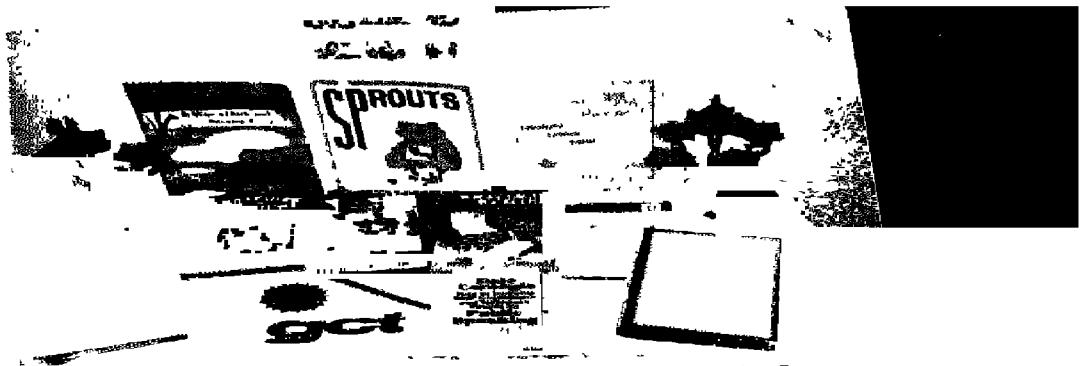


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## INTRODUCTION

The development and utilization of nation's human resources prove to be the best indicators of economic prosperity and social advancement. This principle was recognized by Plato who observed over 2000 years ago that the state's gifted leaders are its most valuable asset. Society has at its highest level need for group of individuals-creators or innovators who are and will be cutting edge of social, scientific, artistic and spiritual progress. Such innovators ask questions, are sensitive to problems, and see relationships which open up new areas for cultural advancement. Though small, this group is more responsible than any other for the advance of the society. These are the people who will translate new concepts and discoveries of innovators into useful products and institutions.

Gifted are the ones who make economic and social progress possible. Without them-without the contributions of great minds, the ideas of original thinkers who stand out from the crowd, whose innovations and creative ideas advance the frontiers of knowledge the world indeed will be a barren place. In every age, there is need for gifted persons who will make a major contribution to new developments, in technology, social science, art (Carroll, 1940). Thus, society is every dependent on the insight and the foresight of its ablest citizens (Gardner, 1957).

The New Educational Policy (1986) emphasize the education of the exceptional children especially in the area of gifted/talented children. A gifted child has always been an object of concern and also at the same



time of total neglect. While everyone connected with or even unconnected with the process of education has been crying hoarse about nurturing talent, excellence and creativity, pretty little has been done beyond this (Rao, 1986).

### Who are the Gifted?

Through the years, various terms have been used to describe unusual children: child prodigy, precocious, gifted, highly talented, creative. In educational literature before 1900, the term "bright" applied to school learners, often in contrast to slow, dull or stupid. "School brightness" was also commonly used; bright children were sometimes referred to as "mentally exceptional", "children of superior intelligence" and "abnormally intelligent children" (Hildreth, 1969). Laymen use the word "gifted" to refer to especially talented individuals or to those who possess superior mental ability.

Although the term "gifted child" did not come into popular use until 1912 and 1918, it was used to several reports as early as 1912 and 1913. Dr. Guy M. Whipple used "supernormal children" in his early writing and Dr. Leta S. Hollingworth used "Prodigious Child". Dr. Lewis M. Terman used the terms "super normal" "bright" and "prodigious child" to designate mentally superior children; later on he used "genius" to describe the most highly endowed intellectually. Today the term "genius" is generally reserved for adults who have made original contributions of unusual distinctions. Bright children have also been referred to as "mentally advanced" or "mentally accelerated" (Dehaan and Havighurst, 1961).



DEFINITIONS:

There is no universally agreed definition of the gifted. The earliest definitions of gifted children, based on objective criteria were stated in terms of rank or IQ on intelligence test, most frequently the Binet Scale.

1. Terman (1925) and Hollingworth (1931) in their pioneering longitudinal study of gifted children proposed that "gifted" are those having an IQ of 140 as measured by the Stanford-Binet Intelligence Scale".

Hollingworth (1931) is also of the view that the "gifted" as children who are in the top one percent of the juvenile population in general intelligence. She held the view that general intelligence is the "power to achieve literacy and to deal with its abstract knowledge and symbols".

2. At a conference on the Gifted held at Teacher's College, Columbia University in 1940, intellectually gifted child was defined as one who excels markedly in ability to think, reason, judge, invent or create (Dehaan and Havighrust, 1961). The National Council for the Gifted Inc., (1949) includes in its definition of the gifted, those young people of high intelligence who in addition, possess the potential for unusual performance in any creative, socially useful area of human concern (Hildreth, 1969).

3. Dehaan and Havighrust (1957), Neville (1959) prefer to include all sorts of outstanding talents and aptitude in the definition of the gifted. They pointed out that the gifted are those children who possess one or more of the following abilities mentioned below:



1. High level scholastic or academic subjects
2. Superior intellectual potential
3. Superior talent in expressing arts, crafts, creative, writing music, mathematics and science
4. Special mechanical ingenuity
5. Social leadership
6. Exceptional originality and inventiveness. Any ability that is complex and constructive can be included .
4. Neville (1959) defines the gifted as "those who have superior functional ability to achieve academically in the top 15 to 20 percent of the school population.
5. Flielger and Bish (1959) use the following definition "the term gifted encompasses those children who possess a superior intellectual potential and functional ability to achieve academically top 15 to 20 percent of school population and/or talents of a high order in such special areas as maths, mechanics, music, science, expressive arts and a unique creative ability to deal with the environment .
6. Sumption and Luecking (1960) define gifted as those who possess a superior nervous system characterized by the potential to perform tasks requiring a comparatively high degree of intellectual abstraction or creative imagination.
7. Dehaan and Havinghurst (1961) define gifted children as those individuals from kindergarten through high school age; who show unusual promise in some socially useful area and whose talents might be stimulated .



is less likely to be thought of as "gifted". The idea that the gifted are those with special talents is more acceptable to most people than the concept of giftedness as all round intellectual superiority because it seems more fair to the youngsters. The "special talent" category would include more of those who are "not so bright". Hildreth views that the gifted child is one whose level of cognitive development is advanced beyond children of comparable age as measured by standard tests.

12. Havighurst (1968) remarked that "the gifted are those whose performance is consistently remarkable in any potentially valuable arts such as music, graphics arts, dramatics, mechanical skill, social ability and other forms of behaviour.

13. A widely accepted view is that giftedness in young people is primarily a matter of special talents; the gifted child is one who is specially talented in music or art, in dancing or dramatics or in a particular school performance, as in the case of a child who can do complex mathematical computation in his head (Abraham, 1969).

14. Kirk (1970) opines that gifted children are those who have superior ability to deal with facts, ideas and relationships.

15. A widely accepted view is that giftedness in young people is primarily a matter of special talents. Gifted and talented children are those identified by professionally qualified persons who by virtue of outstanding abilities are capable of high performance in any of the following areas:

1. General intellectual ability
2. Specific academic aptitude
3. Creative



or productive thinking 4. Leadership ability 5. Visual and performing arts  
6. Psychomotor ability (Martington, 1972).

16. Gallagher (1975) states that the gifted children are exceptional children who show remarkable performance and/or unusual ability of a high order in any potentially valuable area such as general intellectual ability, specific academic skills, creative or productive thinking, leadership ability, visual and performing arts and psychomotor ability.

17. The U.S. Congress (1978) defines the term "gifted and talented children meaning children and whenever applicable, youth who are identified at the preschool, elementary or secondary level as possessing, demonstrated or potential abilities that give evidence of high performance capabilities in areas such as intellectual, creative, specific academic, or leadership ability, or in performing and visual arts, and who by reason thereof, require services or activities not ordinarily provided by the school".

18. Bhatia and Safaya (1980) define gifted children as "those with superior intellect. They exceed, in terms of intelligence quotient of 125 or 130 and generally fall within a range between <sup>130</sup>IQ and 180 or above.

19. According to United States Office of Education (USOE) (1982) "Gifted and talented children are those identified by professionally qualified persons, who by virtue of outstanding abilities are capable of high performance. These are children who require differentiated educational programmes and/or services beyond those provided by the regular school programme in order to realize their contribution to self and society"



20. Howard and Orlansky (1984) define gifted and talented children as "those children who give evidence of high performance capabilities in areas such as intelligence, creativity, leadership capacities or specific academic skills and who require services or activities not ordinarily provided by the schools in order to fully develop such capabilities". They proposed that gifted children are those who possess 1. Above average intellectual ability 2. Creativity 3. Task commitment or have the potentiality to develop them and apply them to some worthwhile area of performance.

An intellectually gifted is so much a talented child who show remarkable performance in any worthwhile line of endeavour e.g. the child is socially talented, mechanically talented, artistically talented, musically talented, academically talented (Usha Rao, 1987).

In conclusion, it can be seen that all these definitions emphasize that the gifted is:

- \* One with such a high measure of competency that he is able to learn more than the prescribed curriculum with the prescribed time under prescribed conditions
- \* One who excels in creative thinking and abstract reasoning, has a wide scope of interest and produces work of superior quality
- \* those with special artistic and mechanical talents
- \* One with a high IQ
- \* those with unusually high mental capacity, with extra-ordinary aptitudes for school work and with special talents for making superior contributions to society.



- \* A child whose mental, physical and social traits are similar to those which are known to be representative precocious children
- \* One whose mental age is considerably higher than his actual age compared with children in the general population

CHARACTERISTICS OF GIFTED CHILDREN:

The traits of gifted children were first described by Sir Francis Galton in the late 19th century. Since that time, there has been investigation covering all aspects of the behaviour of bright children. Most studies of gifted children pertain to those who have been identified through mental tests, more particularly, Stanford Binet Test; hence the largest store of information about the gifted relates to those who were initially selected on the basis of intellectual superiority. The largest source of objective information about traits of the mentally gifted in Terman's Study of 1,440 California Children who were in middle childhood years when first identified.

The typical gifted young person has multidimensional abilities of high order. Terman's gifted subjects were superior in physical characteristics, school achievement, maturity of interest, social and personal traits. The only exception was average ratings in mechanical aptitude (Hildreth, 1966).

1. Physical Characteristics: Dynamic Energy Appearance and Health:

Popular opinion pictures gifted children physically underdeveloped; imagined to be under-weight, under-sized, bad-sighted etc. Research Studies



contradict all this. Most gifted have been found to be physically superior to the normal children of their age (Rang, 1976). Gifted Children tend to be mature for their years in size, physiological development and motor control. In general, they are healthier than average, of better appearance and more attractive physically, better coordinated and enjoying a richer and fuller life. In 37 different anthropometric tests, Terman's gifted subjects prove to be superior to the norms for children, children of comparable age in height, weight, lung capacity and muscular strength (Burke, Jensen and Terman, 1930; Abraham, 1969). Age for age, they exceed the developmental norms for average children. Hollingworth (1926) reported that high IQ children were large and stronger than their agemates.

In general gifted children are generally above average in physical health and strength. During school years, they reported less frequent headaches, malnutrition, mouth breathing or defective hearing for the gifted group. But the incidence of colds and other contagious diseases was about the same as that for other children. Eye examination showed about the same incidence of visual defects, although the history of the early reading habits of these children might lead one to predict more eye trouble (Strang, 1949).

This physical superiority of the gifted has been maintained throughout the years. At the average age of 44, their mortality was four-fifth that of the general population (Gallagher)



2. Intellectual Traits. Highly gifted children show mental precocity from an early age. Although Dehaan and Havighurst (1957) strongly emphasize the diversity of talents, they also state that general intelligence is basic to all of them. In other words, children, with a special talent or talents would probably be of above average intelligence, though not necessarily as high as the generally academically talented. Almost all children of high intelligence would show this particularly in certain talent areas. As viewed by Lehman (1949) gifted children have a capacity of good understanding, insatiable curiosity, extensive information, retentive memory, large vocabulary and unusual interest in such things as number relations, atlases and encyclopedias.

According to Lehman (1949), the gifted show some unevenness in achievement in different fields. They are best in arithmetic, history and English. They are weakest in writing, art and handwork subjects and English. They are writing, art and handwork subjects requiring manual coordination or dexterity. Gallagher (1967) points out that the higher IQ group was more than a year in advance of the lower group in all the reading comprehension tests, in spelling, in nature study and science information and in difficult mathematical processes including fractions and long division. Even in their poorer subjects, however, they tend to maintain a higher level of performance than the average pupil.

The gifted tend to become immersed in a given topic and to study it in complete detail, showing maturity in making and carrying out plans.



These children master scholarly skills early, the use of a slide rule, compass set, a dissecting set etc. (Brandwin Paul, 1965).

Mentally gifted children have a strong disposition toward intellectual activity, a liking for reflective and abstract thought and ideas and interest in scholarly pursuits.

According to Dr. Terman, signs of youthful intelligence are intellectual curiosity and imagination, extensive knowledge, superior verbal comprehension, rich vocabulary, ability to assimilate and generalize and interest in number relations, the atlas and the encyclopedia (Brandwin, 1965).

a) Intellectual Curiosity:

In speaking of gifted children, Hall (1956) remarked that the gifted displayed two main qualities first i) a sense of wonder and curiosity and second ii) creativeness—the desire and power to invent something new. Although all normal young children show a sense of wonder and curiosity about their surroundings, and even display some creative ability and invention the gifted child shows these qualities to a more pronounced degree and in advance of his age. Although the gifted child shows his superiority to others in a number of traits the degree of superiority is greatest in intellectual interests, originality and in school achievement (Walter, 1961)

b) Independent Learning:

Incidental learning or spontaneous learning from rules in the environment without direct instruction appears to be characteristic of young gifted children. These children learn a great deal spontaneously



independently because of their general alertness and their questioning attitude. They seek and demand facts. For example, the use of gauges for measuring (Hildreth, 1966).

c) Philosophical Learning:

The gifted child shows an interest in moral issues and social problems that ordinarily do not appeal to others of the same age. He is fascinated by questions of time and space, origins, destiny of life and death. Dr. Terman reported that his subjects were often concerned with problems (Hildreth, 1966). As all others, the gifted ask incessant questions, but their questions reveal more advanced thinking for the age, tend to wait for answers and pursue the point until they are satisfied (Hildreth, 1966).

d. Thinking, Learning and Conceptualizing:

The outstanding trait of children who rate high in intelligence, is their ability to think, reason and generalize beyond their years. Gifted children show precocity in thinking abstractly and forming generalizations, apart from perception of concrete situations or representations. This superior generalization power enables them to apply an operation to a variety of relevant tasks (Flanagan, 1962). They can grasp and apply principles in problem solving on advanced level (Hildreth, 1966).

The trait of gifted child that seems most uncanny is the speed with which it makes inferences and arrives at solutions to problems. The



gifted child organizes his thinking more effectively than typical life age children. He catches on to "the system" the rules and principles which help him to organize his ideas (Hildreth, 1966).

e. Intuitive Reasoning and Prodigious Memory:

Bright children are very intuitive in the way in which they go about getting answers to questions. The prodigious memory of exceptional children in the early years, memory for unusual words, poems, scientific nomenclature, musical sciences, arithmetic facts and all kinds of unassorted information. These children learn easily because they understand what they are learning.

f. Prodigious Memory:

The prodigious memory of exceptional children in the early years, memory for unusual words, poems, scientific nomenclature, musical scores, arithmetic facts, and all kinds of unassorted information may be the most obvious sign of precocity. These children learn easily without prolonged drill and remember what they learn not only because they are attentive and comprehend instructions easily, but also because they understand what they are learning (Abraham, 1969)

4. Control of Language and Verbal Behaviour:

Mentally gifted children tend to range above average and ahead of their years in linguistic development and control of verbal behaviour. They are accelerated in use and understanding of vocabulary, in maturity



of sentence structure and in originality of expression. Bright children use longer, more complex sentences sentences and more mature expression than other children of their age (Strickland, 1960).

5. Reading Habits of the Gifted:

On the whole, the gifted out distance their agemates in learning to read. Often they cannot recall how they learned to read or remember a time when they are unable to read. Not all intellectually gifted children are addicted to books, however some of them prefer to concentrate on inventive projects and experiments in which, for the time being, books play little part.

6. Play, Interests and Activities of Gifted Children:

It has been found that gifted children are generally physically large, well-developed and mature in their play and social interests. They are not less interested or less skilled in play than ordinary children. Studies show that they seek companionship to some extent as other children (Freehill, 1961). Terman found that gifted children are slightly less competitive, slightly more interested and quiet and involve in thoughtful games, and slightly more involved with imaginary playmates. It has been found that play interests of gifted children show some permanence.

Children who are mentally advanced tend to reveal interests that are in accord with their precocious development. Their hobbies often have an intellectual flavour—stamp collecting and arranging, looking up facts



in the encyclopaedia, inventing puzzles and so on. They may be more inclined to spend their spare time in pursuit of individual interests than in typical after school club activities.

#### 7. Academic Achievement and School Accomplishment:

As a general rule, there is a substantial positive correlation between children's intelligence as measured by reliable tests and school achievement. On the whole rapid progress at school characterizes the mentally accelerated child, the rate of progress corresponding somewhat to the degree of acceleration indicated by the IQ. In the major studies of Terman, Hollingworth and others, high IQ children were accelerated in basic skills-reading, arithmetic and language and in the content studies.

##### 1) School Progress:

Early attendance, rapid grade advancement, and more than average interest in theoretical subjects characterize gifted children in school (Carnichead, 1968). As stated by Hetherington and Parke (1986) most gifted children like school, if it is a reasonably good one. They are often accelerated, almost never retarded and are absent less than general population. They often have a keen sense of humour, enjoy free discussion and are creative and original.

Gifted children's school subject preferences correlate with the teachers' estimates of the quality of their work in the different subjects to the extent of 44 (Terman, et al. 1925). Because of their greater competence, gifted children were less likely than other children to have



personal problems, related to their efficiency in mental tasks. But their level of aspirations also is likely to be high. They compare themselves with eminent persons whose autobiographies they read. They live under considerable social pressure. It is significant that many Harvard Freshmen expressed feelings of inferiority and inadequacy (Murray, 1938).

Hollingworth and Cobb (1928) compared a series of achievement test scores of two gifted groups of 20 children each as they progressed in a special public school opportunity class during a two year period found a brighter group, clustering around 165 IQ, maintaining its superior status over a less bright group (145 IQ). Although educational opportunity had been the same for both, results showed the excess for the high IQ group to be most marked in tests.

ii) Scholastic Interests and Pre-occupations:

In scholastic areas, the gifted children were more interested than the controls in abstracts subjects such as literature, debate and ancient history and less interested in "practical" subjects such as penmanship and manual training. Gifted and controls were equally interested in games and sports.

8. Personal and Social Traits:

Terman (1925) found the gifted children as a whole and to be above their age level in all the traits studied. The gifted nine-year olds were rated as equivalent to children of 14 in character development, they showed a better spirit of cooperation than other children, were neither



domineering nor egoistical, showed respect for authority and intellectual discipline, were less influenced by suggestion than their age mates and proved to have a sense of humour. They rated high in earnestness, trustworthiness, honesty and emotional stability as well as in capacity for objective self-appraisal. Most of Terman's (1925) subjects were superior in personal adjustment. There were some cases of serious maladjustment.

The 100 gifted children tested by Witty (1930) turned out to be equal to the general population in emotional maturity, in the ability to adapt to conditions they would not change, and in the number of behaviour problems they exhibited. Boehm (1963) investigated the development of moral judgement in children. He found that the gifted were more mature in their moral judgements concerning distinction between the intentions and outcomes of an action.

Social traits tend to follow the usual developmental age patterns in such characteristics as interest in playing with other children, in organized group games, team organisation, association with the opposite sex and so on. Traits of the gifted vary with the age of the child. Obviously children of equal superiority will show different traits at age five, ten and sixteen (Dehaan and Havinghurst, 1961).

Miller (1956) found that gifted children were significantly more popular than average or retarded pupils. Kersh Reisman (1984) studied a group of highly gifted children in special classes and found them on the



whole, socially well adjusted. He found no relationship between level of intelligence and poor social adjustment. He also found that the gifted are well-liked by their classmates because they are attractive individuals who are helpful, outgoing and demonstrate leadership qualities. Kirk (1962) however pointed out that the gifted appear less "sociable" in their interests. They show a stronger liking for playing with just one other person than do controls. On a scale of sociability of play interest, almost half of the gifted fall in the lowest qualities of control group scores (Kirk, 1962).

With regard to peer acceptance of gifted children, Miller (1986) found that gifted children were significantly more popular than average or retarded pupils. Gallagher (1967) concluded that gifted children were better able than average children to predict who would choose them for friends. This social perceptiveness of socio-empathy might account for the above average popularity of the gifted group. However, the degree of acceptance may vary with the community, level of giftedness and type of program.

Social and Emotional Development and Adjustment:

The organizing activity of mind in gifted children is of high degree and this influences the emotional development. It makes them active participants in the process of growing emotionalities. They see that, they have two choices: to yield to the demands made upon them or to visit them. They learn early that they can not always have what they want.



Understanding or perceiving the situation clearly, they act on thinking rather than on the impulse of the moment. Seeing more clearly the consequence of certain behaviour, they are willing to forego an immediate satisfaction in far or of a more distant goal (Cutts and Nicholas, 1953).

On the Farfey Test of developmental age for boys and the analogous form prepared by the Sullivan for girls, 26 gifted boys and 24 gifted girls, as compared with an unselected group, showed a wide variation in maturity from item to item. The gifted group, however tend to rate higher on certain aesthetic and intellectual aspects of development. (Thorndike, 1940).

#### Moral Characteristics:

Their moral attitudes are superior, most gifted children are patient, conforming and concerned for the welfare of others. High intelligence sometimes leads to rejection of popular choices and social confirmity. But the same qualities sometimes leads to the acceptance of common practice (Sujatha Rao, 1987). Gifted Children are moralists. They accept responsibility and sometimes guilt, for group actions or failures. They are usually strict with themselves. They often set high standards for themselves, their families and those around them. There is a tendency to self-criticism and to discover and correct their own errors.

They also have a strong sense of responsibility and hence are dependable. It has been found that gifted children express sympathy with suffering, feel indignity at injustice, seek to rectify their own or other



children's blunders, remodel their own handwork and express fears over surgery, death, war etc. In general, it has been found that superior children of all ages and sexes surpass normal children in all desirable character and personality traits. They are less prone to make over-statements and to cheat. They are judged more wholesome and mature and they score above average on an emotional stability test.

Heredity and Home Background:

The intellectually gifted come from all strata of society, including a very poor and the minority communities as the scheduled castes and scheduled tribes because high intellectual qualities are not confined only to economically or socially superior groups, although people like Terman showed long ago high correlation between intelligence and socio-economic status. Thirty-one percent of the fathers were professional and 50 percent were semi-professional or in business, 12 percent skilled labourers and less than seven percent semi-skilled and unskilled (Terman, et al. 1925).

They come from all racial, ethnic, religious, rural, urban groups, in higher or low scale of social and economic positions. In Terman's study, all racial elements in the areas covered were represented in the group, including Orientals, Mexicans and Negroes (Terman, et al. 1925). Some such children living in unstimulating environment may not be noticed, they remain potential rather than actual contributors (Usha Rao, 1987).



Gifted children in the United States have been more frequently found in the racial groups in which in the past century economic, social, educational and professional leadership has been generally centered. Yet exceptions have also appeared, indicating that superiority may occur in any of the races of ethnic groups that have contributed to the American population (Carmichael, 1958). In summary, it may be said that although it is true that under existing social conditions, certain racial or ethnic groups produce relatively more gifted children than others, no final conclusions about the relation of giftedness and race should be drawn until wider regions are sampled and conditions for the study of social inheritance are more fully understood (Hollingworth, 1926).

In order to confirm about the environmental influence on the gifted children's characteristics, Newman, Freeman and Holzinger (1937) studied the 19 pairs of twins reared apart. It was shown that the greater differences in home environment and schooling of the two members of a pair the greater the difference in their IQs, ranging up to over 20 points (Vernon, Adamson and Vernon, 1976). Among identicals reared in the same home, the average difference is only about five points.

Further demonstration of the importance of education comes from Lorge (1945) in America and Hussen (1951) in Sweden who showed that the amount of secondary and higher schooling received made a difference up to 12 points in adult IQ. Allowances was made for any initial differences in child's IQ between those who left school early and those who went on to further education (Vernon and Vernon, 1976).



Khineberg (1935) and Lee (1951) found that black children whose families emigrated from the southern states to Newyork and Philadelphia gained significantly in IQ according to length of residence in northern cities where Negroes experienced somewhat better economic and educational conditions. At the same time it is noteworthy that the maximum use was limited to an average of about seven points; Negroes did not make up the full 15 points which usually differentiate them from White. More recent studies of Italian immigrants to the USA (Barroch and Young, 1970) and Jews and Israel (Lieblich, etal. 1972) indicated that the descendants of white backward parents catch up with the local norms of intelligence in a generation or two (Vernon and Vernon, 1976).

Extra-Curricular Pursuits and Interests:

Children who are <sup>on a</sup> mentally advanced level tend to reveal interests that are in accord with their precocious development. Their hobbies often have an intellectual flavour.— Stamp collecting and arranging, studying flight schedules etc. Gifted children often prefer sedentary game of some complexity because these appeal to their intelligence and provide association with older companions (Hildreth, 1966).

A gifted child may explore in many fields before settling down to more permanent interests and hobbies. One week he will concentrate on repairing clocks, the next he will read about the history of clock making, another time he writes stories about how the ancients told time. Eventually he will specialize in a particular subject, possibly mathematical games and puzzles or science writing (Ruth, 1960).



In Dr. Whipple's early studies, bright children were asked what they wanted to be when they were grown. Practically everything was listed that children in grades 5 and 6 would normally mention; mechanic, dressmaker, soldier, farmer. Similarly, the vocational aspirations of the mentally exceptional children studied by Hollingworth revealed nothing unusual (1926). Whether differences would be found in gifted children of contrasting socio-economic backgrounds remains to be determined.

Why Identifications Is Important:

Many people wrongly believe that a gifted person does not need to be identified or given any special assistance, because giftedness will somehow come out of a person inspite of an uncongenial environment. Torrance ( ) says that these arguments are false and lead to dangerous consequence. It is true that some of them will sacrifice their creative only for a while and will regain it when they learn better how to cope with coercive pressures. However, some of them never regain their talents and select the paths of delinquency, mental illness or a life of mediocrity and unrealized possibilities.

Identification of giftedness helps specially in the following ways: 1) Identification leads to dramatic change not only in the functioning of children once they know that they are gifted but also in the behaviour of their teachers. The teachers begin to show extra interest in the gifted child and try to do some thing for them. In some cases, the teacher's changed behaviour towards the gifted child became turning points in a child's career when the recognition received helped him develop better his



potentialities ii) Identification of gifted children serves as a basis for individualizing instruction to suit these children as a group, as also to suit each gifted child's needs. Most of our Indian classrooms attend to the needs of average students. This leads to the problems of motivating and guiding children who are different from the average. Research has shown that tangible result could be obtained if gifted are properly identified and teaching, examining and evaluating methods of children's work is changed.

Identifying the Gifted Child or Identification of the Gifted:

In every generation, many gifted children pass through school unidentified and uncultivated. Children from low socio-economic or foreign culture whose lack of verbal ability conceals their merit, those who have to dropout of school for economic reasons, those from minority groups and those with emotional problems are often not detected as potentially gifted.

In the area of sports, people keep searching for promising tennis players, swimmers, football players etc. and the school and community provide many opportunities for budding children and adolescents to practice and improve their skills. Coaches are available to train them. However, it is disheartening to note that the need for doing the same for the talented young scientists, engineers, artists and other gifted children among our children is lacking. As in the world of sports, the first step in developing the talents of gifted children is identifying these children, and this, in a systematic way.



Talent searchers are on the look out for children who show intellectual and academic aptitude of a higher order, originality and creativity, special interests and talents and leadership potentials. The planning of educational opportunities and specialized services for these children depends upon reliable method of identification and continuous appraisal of each individual. Freehill (1961) opines that identification of the gifted and talented requires a many-sided study of the individual's intellectual abilities.

As contributions of the gifted are highly valuable, systematic identification of the gifted children is very essential. Systematic identification involves the choice of right time and techniques for identification. Precaution should be taken to ensure right use of techniques and also right interpretation of the information obtained from the use of these identification techniques (Rao, 1986). Now there are numerous new methods for identifying gifted children.

Identification insists in the process of screening children by means of standardized test procedures and/or observational methods and selecting the superior children for educational programmes designed particularly for them. The purpose of this procedure is to enable educationists to decide whether special educational provisions should be provided. Identification is not a goal in itself. It is a means to a goal of getting each gifted child into the educational programme but suited to develop his capacities and his whole person (Bhatt, 1973).



There is a lot of evidence that identification and recognition programmes increase enormously the motivation of gifted children. There is every possibility of reducing the "school drop outs", "among children", if they realize that they are talented and hence will be motivated to achieve distinguished careers, through award of scholarships etc.

Procedure for identifying should be functional, systematic and inclusive. More refined measuring instruments have been developed over the last few decades. At one time giftedness was measured solely by achievement but now it has come to mean high aptitude and creativity as well (Goldberg and Passow, 1966).

No one method of identifying gifted children is in itself sufficient. Therefore, a combination of methods and personnel must be employed (Vernon, 1977). Subjective evaluation, such as teacher or parent-referral needs to be checked by more objective measures of ability such as standardized tests. Any programme for identifying the gifted child in a school system should include both subjective and objective methods of evaluation.

Laycock (1957) recommended the following plan for the diagnosis of giftedness in a general or special sense:

1. Observation by the teachers who is guided by a 20 item check list
2. Results of standard achievement tests
3. School records
4. Results of standard tests of mental ability
5. Individual Intelligence Tests

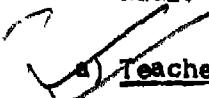


Systematic Observation:

The method of personal observation is one of the major ways of identifying the gifted. The role of human observation and judgement in screening and selecting is a major one. Observations obtained from many sources; teachers, children, parent and other adults who are acquainted with the gifted child may be used by the teacher to identify and understand the gifted children in his class. Almost every programme of identification includes teachers' observation and judgement among the procedure (Havighurst, 1955).

Freehill (1961) Wallach and Wing (1969) list the following clues for observation in the gifted child:

1. The first clue to high ability is precocious behaviour or early learning
2. The second characteristic of superior intelligence is the ability to generalize
3. The third important clue is a complex of exploration, invention, curiosity, foresight and originality
4. The fourth characteristic that may be observed is a tendency to self-criticism and moral anxiety
5. The fifth quality on an observation scale might be perseverance
6. The sixth observational characteristic is social eagerness-a desire for adult acceptance and generally a social conscience

  
a) Teacher's Observations: Teachers are outstanding judges of superior ability in judging their pupils. Experience has shown that teachers



generally are able to identify less than one half of the gifted children in their classrooms (Pegnato and Birch, 1959). Teacher's observations and judgements are particularly appropriate for identifying talents that are expressed rather consistently but not intensely, that is, the non-intellectual abilities. Examples of consistent abilities are leadership and friendship, which can be observed in children every day. Most teachers have opportunity to observe a wide variety of talents in children quite readily, since most classrooms provide a wide variety of experiences for children. Hence it is possible correlate and correct test results with the experienced judgement of teachers and to use these judgements in many areas where tests are poorly developed. Teachers are able to recognize bright children by the use of check lists, guides, rating scales, anecdotal records, sociograms or other similar devices.

For the most effective use of teacher's observations as talent identifying procedures, teachers should be provided with behavioural description of children's characteristics that are valid clues to the talent to which he is looking. This will help the teachers in making observations, which present description of behavioural characteristics for all important varieties of talent, as well as for scientific and intellectual abilities (Kough, 1960).

Given this kind of guidance and training in observing, teachers may become apt in recognizing and identifying children with unusual abilities of many kinds. One of the important bonus benefits obtained from teacher's



observation is that observation tends to make the teacher more sensitive to individual differences in children and more aware of giftedness (Agato, 1983).

However, there are limitations of teacher's nominations. Dr. Guy M. Whipple was among the first to call attention to this fact when in 1919 he and Dr. Genevience Coy administered mental tests to gifted children nominated by teachers and school principal. He found that the selection of the gifted for special classes must be made on the basis of performance on mental tests because the selection by teachers on the basis of classroom impression and school marks result in the inclusions of some who are unsuited for a special speeded up program (Hildreth, 1966). Pegrato's (1959) research showed that teachers' evaluations are also frequently inaccurate and many psychologists who write on creativity testing claim that teachers tend to disapprove of the unconventional creative child (Vernon and Vernon, 1977).

b) parent's Observation's:

Probably no one knows as much about a given child as his parents. Hence parents' observation in identification of gifted children is a significant one. Parents rarely have any way to judge the equality of the ability of their children and hence may be likely to make large errors. Furthermore, parents have little basis on which to compare the ability of their children with many other children. They may make large errors of judgements. Nevertheless, what parents know about their children is valuable supplementary data to corroborate the result of tests and teachers'



observations or to provide decisive information in some "borderline" cases where the tests and observations are inconclusive (Dehaan and Mavighrust, 1961), Portland (1959) believes that information from parents' observations can be obtained through conferences and by means of questionnaires.

c. Children's Observations:

Another source of systematic data for screening purposes is children's observations of one another. Bright children themselves are usually cognizant of the abilities of their classmates. They are often acquainted with each other in situations quite removed from the classroom and hence, can provide information that is ordinarily unavailable to teachers (Spencer, 1958). Children can be asked to identify almost any talent or characteristic that the teacher wishes to discover, right from intellectual abilities, to other personality, emotional and physical traits. Although their judgement may not be solicited, children's recommendations should not be ignored.

d. Observation of other Adults and Self-Observations of the Gifted Child:

Observations of other adults acquainted with a child can likewise be obtained through interviews or questionnaires. Further some successful, special programmes run for gifted children in the U.S. used "self-identification" and therefore, "self-observation" as a means to identification (Dover, 1987)



## II. Identification By Standardized Tests:

Having considered "systematic observation", particularly teacher's observations, and how this can be supplemented by observations from other sources, let us consider the other major methods for identifying gifted children through the standardized tests such as intelligence tests achievement tests, tests of aptitude etc. (Dehaan and Wilson, 1965). Standardized tests have the merit of being uninfluenced by the teacher's judgement in evaluating aspects of ability and achievement. They provide a means of ranking a child above or below the established norms for the general child population, and they furnish a comparable set of observations independent of the types of school the child attended or the marking system used. Standardized tests are valid, practical and economical to use. The various types of standardized tests are explained as follows:

### a) Intelligence Tests:

Among the psychological tests, intelligence tests have been the chief measures of identifying the gifted children. These tests measure the general intelligence, which is basic to success in any field. Standardized intelligence tests provide objective evidence of individual differences in learning capacity. They measure the individual's developmental maturation in intellectual qualities and his achievement at the time of the test. Since they are primarily tests of verbal and reasoning ability, general intelligence tests are, perhaps more accurately described as tests of academic aptitude. These tests usually yield an over-all intelligence.



quotient (Kaplan, 1975). The intelligence test can provide the single most important predictor, particularly over the age range of 7 or 8 to 15. Intelligence tests provide the first objective evidence of individual differences in learning capacity.

Intelligence tests can be classified into two broad categories, namely:

Diagrammatic Representation of Intelligence Tests

Intelligence Test

Individual Test

Group Test

Verbal  
Test

Performance  
Test

Verbal  
Test

Non-Verbal  
Test

1. Individual Intelligence Tests:

They have to be administered to a single individual by a specially trained tester, at a time. The common individual intelligence lists are The Binet-Simon Intelligence Scale, Weschler Intelligence Scale and Cattel's Culture Fair (Free) Intelligence Scale. The above tests facilitate reliable observation measure of intelligence and clinical judgements to be made about the child.

a) Individual Verbal Intelligence Test:

These tests involve the use of language and administered to an individual at a time belonging to this category. As an example of such tests, we can quote Stanford-Binet Scale.



b) Individual Performance Intelligence Tests:

In these tests, the content and responses are in the form of performance and language is not used at all. In these tests, the items which require responses in terms of motor activities are included. Generally, the activities on which the performance of an individual is tested are of following type: 1) Block Building or cube construction and 2) Tests to fit blocks in the holes (Guilford, 1967).

2. Group Intelligence Test:

Group intelligence tests can be administered to a large number of people by a single examiner, they are usually given in pencil and paper form. The most common group intelligence tests are:

1. Raven's Progressive Matrices Scale
2. Draw-A-Man Test

Group Intelligence tests, however, are practical in screening purpose since it is financially prohibitive to expect all children to be given individual examinations (Rao, 1981).

a) Group Verbal Intelligence Tests:

The tests which necessitate the use of language and are applied to a group of individual at a time, come under this category. Some of the earliest test belonging to this category are:

1. CIE Verbal Group Test
2. The Group Test of General Mental Ability
3. Group Test of Intelligence prepared by Bureau of Psychology (Uday Shanker, 1965)

b) The Group Non-Verbal Intelligence Tests: These tests do not necessitate the use of language and are applicable to the group of individuals at a time. In these tests, material does not contain words or numerical figures. It contains pictures, diagrams, geometrical figures.



b) Creativity Tests:

This is another important category of tests for identifying gifted children. They are particularly useful in identifying highly gifted children who would be missed only if the intelligence tests referred to above were used. Several writers urged that reliance on convergent type of intelligence tests picks out the wrong kinds of students. Intelligence tests are almost useless in separating more effective and productive professionals, such as scientists and doctors, from the less effective (Taylor, 1932). Some of the well-known tests for creativity are the Torrance Tests of Creativity, Guilford's Test of Creativity, Wallach and Kogan Tests of Creativity, Passi Test of Creativity, Baquer Mehdi Tests of Creativity..

c) Special Aptitude Tests:

Aptitude refers to the capacity to achieve well in the future, given suitable training. Talents of the same as aptitudes, though the term usually implies exceptionally high ability. Tests of these abilities can be used to gain a more complete understanding of an individual pupil or to identify pupils more surely for special education than the tests of intellectual abilities. (Dehaan and Havighurst, 1961).

Beyond merely measuring the general intellectual level of the individual, the differential aptitude tests distinguish the various mental factors which are believed to account for intellectual ability (Getzels, 1973). Since intelligence is multi-dimensional, that is composed of many factors, the advantage of differential aptitude tests over general intelligence tests



is obvious. They can also identify children whose over-all score may be low but who show one or two extremely high factors. It is, therefore, recommended that differential aptitude tests be used in preference to general intelligence tests, particularly after the primary grade level when the primary mental abilities become well enough differentiated to be rather reliably measured.

Special abilities which may be of interest to those who wish to establish an identification program are clerical ability, mechanical aptitude and various motor aptitudes. Tests of special abilities may also serve to discover diverse talent that may not be found with the general tests (Torrance, 1974).

#### Achievement Tests:

These are well known to teachers, since they are probably the most commonly used for any kind of interest (Clark, 1979). There are standardized achievement tests for determining a child's performance in various subjects—such as mathematics, science, languages, reading and spelling. These achievement tests may also be used to identify giftedness (Vernon, 1977). From the point of view of the education of gifted children, their most important use is to discover academic abilities of high order (Clark, 1983).

#### 3. Identifying in Scientific Ability:

Because of the current emphasis on science, it is desirable to find a way to identify potential scientists. It appears that for persons manifesting



a persistent interest in social problems, no special test is necessary but rather that high aptitude in verbal and mathematics abilities, together with adequate muscular and eye function, provide as good a set of indicators of potential scientific ability as any single test might tell (Bradwein, 1965)

### III. Non-Intellectual Factors:

It is necessary to go beyond the usual tests of academic aptitude, intellectual ability, and school achievement in the search for talent. Non-intellectual aspects of personality such as interests and motivation greatly affect the degree to which intellectual and other talent is used. (Dehaan and Havighurst, 1961). There are tests designed to identify the following non-intellectual factors that contribute to high level performance in students. These are Interest Inventories, Personality Tests, Discovering Aptitudes in the Fine Arts, Creative Ability, Musical Interest and Aptitude, Dramatic Talent, Leadership Ability.

#### a) Interest Inventories:

A wide variety of interest inventories are available. Some inquire directly into the child's interest, others are indirect, using incomplete sentences which the child needs to complete. Vocational interest inventories provide valuable information that may help them in choosing careers (Dehaan and Havighurst, 1961)

#### b) Personality Test:

Personality factors are taken into consideration for identifying gifted children. Personality tests are indeed useful to school counselors



who provide guidance on educational and vocational careers, but they are not generally applied until after age of 15 years. Projective devices have their clinical uses in identifying gifted children. Personality tests based on a factor analysis are becoming more prevalent and may soon provide an adequate instrument with which to measure personality.

#### IV. Identifying Through Leadership Ability:

A modified forced-choice instrument called "Behaviour Development Chart" was developed in Quincy, Illinois to aid teachers in identifying leadership ability. The teacher was given 18 groups of descriptive statements, each group containing five items, she was asked to mark which item in the five was most alike and which was the least alike the child under consideration. The other items were used for other purposes, primarily to identify maladjusted children. An example of one group of five items is given below.

- a) Others come to him for help
- b) Causes disturbances
- c) Is easily irritated, flustered, or upset
- d) Reports those who break the rules
- e) Shows Emotions in a restrained way (Rowntree, et al. 1953).

The names of all the children selected as gifted should be drawn together on a master roster. An individual card could be set up for each selected child, summarizing the test results and the special provisions made for him. The card should follow the child throughout his school career. Test information can be used judiciously for guidance of the child, his teachers and parents.



Screening is an ongoing process that is never completely finished. Even if the identification procedures used in elementary schools are adequate efforts to identify gifted children should be continued in the secondary school. It may happen, for instance that a pupil needs the combination of physical and social maturation, interesting high school curriculum, and masterful teacher to motivate him to put forth his best efforts in a given endeavour. This combination of circumstances may be missing from the lives of a significant number of pupils until they reach high school or even college. It is important for high school teachers and guidance counselors to use the information that was obtained in the elementary school. Data gathered in an identification programme should not be allowed to gather dust. (Treffinger, 1977).

CREATIVITY:

Creativity is a potentiality which influences human activity in almost all spheres of life and expresses one's inner self. Most of the changes and development in our society in the various fields are the result of creative thinking ability. Creativity has become a chief psycho-social motive of the twentieth century. It is now rightly considered to be the very life-blood of civilization because creative talents can change the course of history by reshaping man's world. The proper utilization of talent is a matter of life and death for any society (Agarwal, 1990).



All children are born with creative powers, perhaps in varying degrees. Only in a few children do these powers develop to such an extent that as adults, they can become Einsteins. Every child should have a chance to experience the thrill of creating new things but it is particularly important for gifted children. Not only will their creativity bring them personal satisfaction and pleasure which have a marked influence in the development of their personality but it will also be the means by which society will advance in future. Getzels and Jackson (1962) and Torrance(1962) have stressed that the creative abilities contribute significantly to the acquisition of the educational skills and information. They emphasized on the need of proper guidance for the growth of creative thinking among children without any consideration of high and low intelligence. So, special recognition and motivation is most essential to the gifted child to help him make valuable contribution to the welfare of the community and nation. "Enrichment Programme" is one channel through which these children can effectively benefit.

To make use of this most valuable resource, the first step is to identify such talented individuals early in life, exposed them to a highly stimulating environment after solving their personality adjustment problems, encourage them to become deeply concerned in the areas in which they are interested and then build up in them a high degree of skill through practice or activity in the area of their choice.



### What is Creativity?

The concept of C considered elusive, vague and even mystical recently is now understood in clearer perspective, as a result of recent researches. In the past, it was more or less synonymous with terms like intuition, insight and imagination. Now consequent to numerous studies, creativity has come to be associated with a number of aspects like dimensionality and dynamics of personality which can be objectively tested and measured. Ever since, there has been a phenomenal growth of research and the output on the subject has virtually exploded.

There is still no consensus about how to define or measure creativity. Two fundamentally different approaches to the study of creativity can be distinguished as pointed out by Agarwal (1990). The first defines creativity in terms of test performance and the second approach to study creativity avoids such problems by attempting to measure real life creativity directly and then relating it to other variables, such as personality characteristics and child rearing practices. Real life creativity is expressed in products such as poems, symphonies, books, inventions and scientific theories.

There are no universally agreed upon definitions of creativity. All the definitions of creativity can be placed into three categories on the basis of the emphasis namely the product, the process and the experience (Agarwal, 1990).



The first category of definitions, that is, the product definitions are framed in terms of a manifest product which is novel and also useful.

1. Hugger's and Millard (1946) defined creativity as follows: "Fundamentally, to create means to endow with meaning personalized experience. Usually such an activity involves the creation of something new to the individual".

May (1959) and Hurlock (1972) also view creativity as the ability to make something new.

According to Rogers (1959) "Creativity is the emergence in action of a novel rational product growing out of the uniqueness of the individual on the one hand and the material, events, people or circumstances of his life on the other"

In the words of Nunnally (1970) "the word "Creative" is concerned with the invention of something or production of something that is new, rather than the accumulation of skills or the exercise of book-learned knowledge".

William Thompson (1971) believes creativity to be "the ability to bring something new into existence".

Hurlock (1972) says "Creativity is the capacity of persons to produce compositions, products or ideas of any sort which are essentially new or novel and previously unknown to the producer. It can be imaginative activity or thought synthesis, where the product is not a mere summation. It may involve the forming of new patterns of information derived from past experiences, and



the transplanting of old relationships to new situations and may involve the generation of new correlates. It must be purposeful and goal-directed, not ideal fantasy-although it need not have immediate practical application or be a perfect and complete product. It may take the form of an artistic, literary or scientific production, or may be of procedural or methodological nature.

Daniel and John (1960) view creativity as the capacity of the individual to avoid the usual routine, conventional ways of thinking and of doing things which are workable. It may involve performing new patterns and combinations of information derived from past experiences and the transplanting of old relationships to new situations, or the generation of new relationships.

Trowbridge (1966) while discussing in a seminar the multiplicity of definitions of creativity remarked that creativity must be 1. unusual, imaginative, novel, unique, distinctly different 2. appropriate, apt, worth while, more aesthetic and a better solution.

In terms of contemporary definitions, creativity is essentially an intra-psychic property of the individual which induces him to create or produce products that a) novelty, which evokes surprise in the observer, b) Originality, which is inversely related to changes of occurrence in a given society c) Socio-economic and cultural usefulness as adjudged by a consensus of opinion, and d) A self-sonsummatory character (Raychowdhary, 1966).



He also points out that a person may be called creative if he is gainfully engaged in a creative pursuit, be that artistic, scientific or technological, and produces culturally-definable products that are evaluated as original, useful and aesthetically pleasant by a reasonable majority of qualified people at some point in the socio-temporal continuum (Raychowdhary, 1966).

In the second category of definitions, creating is understood as an underlying process which is divergent, yet fruitful.

According to Stein (1953) "process is creative when it results in a novel work that is accepted as tenable or useful or satisfying by a group at some point in time".

Wallach and Kogan (1965) viewed creativity as an individual's ability to generate cognitive association in quality and with uniqueness. They defined creativity as a bifurcate associational construct in terms of associational fluency and response uniqueness.

Torrance (1971) has defined creativity as "the process of becoming sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies and so forth, identifying the difficulty, searching for solutions, making guesses or formulating hypotheses about the deficiencies, testing and retesting these hypotheses and finally communicating the results".



Sir Frederick Bartlett (1959) employs the term "adventurous thinking" which he characterizes as "getting away from the maintrack, breaking out of the mould, being open to experience and permitting one thing to lead to another.

Rhodes (1962) has defined creativity "as a phenomenon in which a person communicates a new concept.

Buhler, et al. (1953) view creativity as a manifestation of building instincts, as expression of those tendencies toward expansion, by continuous productive and reproductive activity.

Creativity as conceptualized by Guilford (1967) involves a specific kind of thinking, labelled by him as divergent thinking. According to Guilford, divergent thinking makes excursions from the beaten track and seeks variety. It goes beyond the obvious and apparent, considering several possible answers to a problem not one correct solution. This contrast with "convergent thinking" which follows the conventional path with the thinker using information at hand to arrive at a conclusion that leads to one right answer, an answer similar to that which others would reach.

In the third category of definitions creativity is defined in terms of subjective experience which is inspired and immanent.

Maslow (1954) emphasized on the importance of the flash of insight, the transcendent sensation itself without reference to whether it will ever



result in anything tangible. The important point is not the "inspired product" but the "inspired moment".

Getzels (1960) has attempted to define creativity in a different way. He gives primacy to the nature of the problem rather than to the solution. The important element in the creative behaviour is the envisagement of the creative problems as it is the fruitful question to which the novel situation is the response.

Jones (1972) defined "creativity as a combination of flexibility originality and sensitivity to ideas which enables the thinker to break away from usual sequences of thought with different and productive sequences, the results of which give satisfaction to himself and possibly to others."

In the light of the various definitions, it may be concluded that most of the definitions defined creativity either in terms of process or product. These two aspects, however, are not mutually exclusive, because process always leads to product and product is always a consequence of a process. Guilford (1952) enumerated six traits—sensitivity, fluency, flexibility, originality, redefinition and elaboration of creativity.

#### Elements of Creativity:

Guilford and his students undertook to discover and define the complex of abilities that together make up the concept of creativity. The related abilities of creativity include the following: imagination, originality, fantasy, fluency, flexibility, sensitivity and curiosity.



### The Natural Creativity:

Creativity covers a wide range of phenomenon. Taylor (1959) has suggested distinguishing five levels from the simplest to the most advanced. These include:

1. Expressive Traits: Expressive as exemplified by imaginative play may show little or no skill or originality but is an independent expression of the individual concerned.
2. Productive Traits: Productive refers to utilization of some technique or control in a productive manner. Eg. games, crafts, etc.
3. Inventive Traits: Inventive refers to exhibiting originality and flexibility and not merely imitative qualities
4. Innovativeness: Innovativeness refers to embodying a significant departure from the conventions, standards in art or science.
5. Emergentative: This refers to discovery of a new and fundamental principle, (eg. relativity)

### Creativity and Intelligence:

Empirical researches have still not given a clear answer to such questions as to whether creativity is an ability distinct from intelligence. Factor analysis conducted so far, could not continuously demonstrate independence of creativity from intelligence. Burt (1964) and McNemar (1964) have doubted the possibility of creativity constructs completely independent of intelligence. Travers (1973) has also concluded that whether or not



creativity tests <sup>exist</sup> separate dimension distinct from intelligence is not entirely clear (Pathak, A. 1989).

It has been argued that intelligence upto a certain level has a significant relation with creativity but beyond that no relation exists. This position has been supported by Schubert (1973) who found intelligence and creativity to be intimately related in a low range of intelligence but in a higher intelligence range, the two to be independent to each other. This position lends support to conclude that intelligence allows the development of creativity but does not have such development of creativity in high range of intelligence. As such, it can be concluded that within the whole range of IQ there is no uniform relation between intelligence and creativity (Pathak, A. 1989)

Creativity . . could be classified into four groups based on their joint standing on their creativity index and intelligence scores. The four groups would be the 1) High Creative - High Intelligence 2) Low Creative - Low Intelligence 3) High Creative - Low Intelligence 4) Low Creative - High Intelligence. This classification of creative individuals into four groups has been necessitated due to reflection of intimate interaction between creativity and intelligence (Pathak, 1989).

#### Enrichment Activities to Foster Creativity:

Enrichment as we know refers to providing opportunities to provide more varied and challenging tasks to gifted children in addition to regular



classroom. Enrichment can be provided in different ways to foster creativity. Special teachers can be engaged in order to provide instruction in art, music, handicrafts etc. in regular schools. Indian schools must seriously consider broadening curriculum to include handicrafts, clay modelling, music, drama, painting, dance, creative writing of original stories, poetry etc. The importance of these fields have been seriously under rated in our schools.

The teacher must provide conditions for imaginative and artistic development. Imagination must be exercised. It should have constant and not just <sup>o</sup> sporadic use. Imagination is based on development of use and meaning. So it is important to provide child tangible opportunities of learning, first about his environment and about the world at large. Imagination is regarded as the means to devise something new and as an ability to reveal new of that which exists.

#### THE NEED FOR FOSTERING CREATIVITY AMONG THE GIFTED CHILDREN:

India is one country which has not given much importance to catering to the needs of the intellectually superior children as compared to the tremendous encouragement offered by the Western countries. Non-availability of funds and resources, lack of properly trained personnel, lack of proper research material available has inhibited the advancement of gifted children, so their talents potentials are totally lost. These children become frustrated as their creative urges are not properly channelized. This makes them indulge in delinquent acts giving rise to mental ill health problems.



The school can not create creativity but it can do much to encourage and develop it. Its prime aim is to encourage each child find himself, to test out his unique thoughts, and to have his uniqueness accepted by his teachers and peers. When the pupils is guided in expressing his abilities in such a way that his own creative self is not blocked, learning will be satisfying, beneficial and pleasant. So teachers of both young and older children need above all to cultivate within themselves a sense of wonder and mystery. They must attempt to look at the world through the eyes of a child.

Classrooms have come in for a great deal of criticisms in recent years as indeed has the concept of creativity. Creativity can and does occur in open classroom. Creativity is not possible in the traditional classrooms as the curriculum pattern is extremely inflexible and does not nurture hidden talents. Hardly any importance has been conferred to painting, drama, music, creative writing. Thus the investigator was enthused to study the impact of enrichment activities on the creativity of gifted children. The present study also strives to highlight the possibility of introducing these activities outside the classrooms so that their regular classroom curriculum is not to be disturbed.

Need for the Present Study:

An informal local survey regarding school programs for gifted students in Tamilnadu indicated that majority of the schools did not have



any special programmes for the gifted. It was left to the teachers/parents and sometimes to the gifted themselves to develop independent study projects to foster critical thinking skills.

Another informal needs survey was conducted by the Child Development Department of J.B.A.S. Women's College for Parents of the gifted children. Parents responding to this survey cited a definite need for after-school, week-end and summer programs for children of exceptional academic ability. Greatest interest was evidenced in programs in science and mathematics. Parents revealed that the limited school offerings were not enough either quantitatively or qualitatively. Implied in their response was that they would support after-school programs.

The statements of these parents in regard to the disappointing nature of the educational programs has been echoed by both educators and parents across the city. They also commented that so called achievement programs existed only on paper and generally lacked programmed comprehensive planning and organization. In many classrooms where teachers claim individualization of instruction, gifted students worked at their own rate of speed but in the same work books. Another problem was the extreme interest in structure, methodology and content of the organized fields of knowledge.

Teachers are faced with many difficulties. In Gallagher's (1979) view, the teacher of the gifted is entering a most difficult instructional



situation because there are so few organized curriculum resources. In addition, the teachers in most of our elementary classrooms are usually generalists who lack the specialized preparation needed to work with this highly intelligent and talented population (Kaplan, 1977).

The parents of gifted children also have problems but they are receiving little help from the schools (Holden, 1980). Naltron (1979) comments that in an ideal program parents should be educated as well. They need opportunities to talk to other parents of gifted children so that they can share the pleasures and problems of raising gifted children. They also need to understand what giftedness is and how they can fulfill their responsibilities as "significant adults in the life of a bright child" (Naltron, 1979).

There are clearly many unresolved problems. Although there has been upsurge of interest in programs for the gifted and talented, there often has not been enough money to find many of them. And then, to complicate matters more, even the programs that do exist frequently do not sufficiently meet the needs of these exceptional students and their parents.

In response to some of these problems, local parent-teacher associations/organizations should form enrichment classes which take place outside the school. Extra-school programs such as Saturday, summer and intensive week-end programs on each and every school campus



is a must. These kinds of programs are beneficial because they can offer gifted children the opportunity to interact with their gifted peers and they are not restricted to the limit on learning imposed by the traditional classrooms. Teachers can also be selected on the basis of merit.

Apparently there is a great need for quality programmes for gifted and talented children. Passow (1979) suggests that educators look beyond the traditional classroom door to find under utilized resources and new models for instruction that utilize settings other than the regular classrooms.

Statement of Purpose:

The purpose of this report is to describe the design, implementation and evaluation of an After-School/Saturday Program for gifted elementary and junior high school students in some selected Madras City Schools.

Statement of the Program:

The problem is to determine if and what changes are necessary for the program. An evaluation was done to provide feed back so that appropriate modifications and revisions could be made in the program.

Significance:

The documentation of this program will hopefully enable others to design, implement and evaluate their own program. It is also hoped that the ERIC will sponsor the major research project proposal which was



submitted by the author so that this program could be administered in a large number of schools in Tamilnadu, thereby reaching many gifted children, whose talents are unidentified, unestimated, discouraged and unfostered. This documentation is also important because as Sarason (1972) points out, we lack descriptions of new settings.

Limitations:

The major limitation of this study is the extent to which the findings can be generalized to other settings. Another limitation is the fact that as the creator of this program, this researcher's objectivity in the evaluation phase may be considered questionable.

Organization of the Study:

In the next chapter, the literature on supplementary After-School/Saturday and summer programs will be reviewed. Then the design and methodology of the study will follow. Two chapters will be devoted, one to lack, of the aforementioned procedures used. The findings of the study will then be summarized and the conclusion presented. The last two sections will consist of the bibliography and the appendices.



## REVIEW OF RELATED LITERATURE

Scientific literature is based on a solid foundation of the existing literature and empirical findings. The review of the relevant literature on a topic, therefore, constitute an essential aspect of a scientific work. Further, it also helps in conceptualization of the research problem at hand and makes the investigator aware of the existing relative status of the literature of the subject. It throws light on the strength and weakness of the literature of a particular discipline and explains the gap that exists in the body of knowledge on the subject. Such review of literature also makes a researcher aware of the nature, kind and magnitude of the work done in the field, and indicates the direction of further studies on the subject. From such reviews of the relevant literature alone, emerge the probable and possible topics of research. The relevance of review of studies on the specific area, therefore, lies in the fact that it helps the researcher to understand and conceptualize the research problem explicitly and meaningfully; and there lies the significance of review of related literature done by the researcher. Therefore, many relevant studies are reported under the following headings.

1. Giftedness - Creativity - Impact of Enrichment Programme
2. Giftedness - Creativity - Effect of Sex
3. Giftedness - Creativity - Effect of Age
4. Giftedness - Creativity - Effect of Ordinal Position/Birth Order
5. Giftedness and Creativity - Relationship



#### 1. GIFTEDNESS - CREATIVITY - IMPACT OF ENRICHMENT PROGRAMMES:

Ayllon, and Syder (1968) attempted to measure the effects of 2 distinct types of stimulation the behaviour of 5 first grade children in a creative dramatic situation. The first stimulus class used verbal prompts. The number of responses to these prompts was counted for each child in each of the five sessions. The number of prompts prod. was increased from 1-17 and decreased to 1.1 prompt produced a mean of 6 responses and 17 produced a median of 35. Second type of stimulus was the performance of a child used as model. The number of motor and verbal responses to this stimulus/child was counted. When the model used was a consistently higher scorer, the scores of the other scorers were high and when the model was low scorer, the scores of the others were lower. Both experiments indicate that the performance of children in a creative dramatics situation is influenced by the stimuli presented to them and that the relationship between the stimuli and the performance can be quantified.

Popperova (1968) examined some contemporary problems in survey of creative art. Analyzes psychical qualities of a creative persons using information from contemporary studies by American Psychologists, four areas are discussed a) intellectual factors of creative activity as specified by J.P. Guilford through tests of divergent thinking b) relation of creative abilities to intelligence and school performance c) character and motivation qualities particular to creative persons d) some fundamental method in the survey of creative activity and their problems.



Plowman (1969) conducted programming for the gifted child. The trend in programming for the gifted is marked by a greater concern for individualized instruction in which attention is given to the development of unique traits and skills based on conceptual research on the nature of the intellect. Typical approaches in regular class instructions, private study, acceleration and counselling are described and the need for ongoing evaluation is pointed.

Deregowski (1970) studied note on possible determinant of "split representation" as an artistic style. Art products of children from diverse cultural background and of cultures that lack highly developed traditions of pictorial art suggest preference for chain type drawings. It seems to conclude that "the observed preferences", unless deliberately destroyed by imposition of the established cultural values persist into adulthood and may result in creation of a corresponding mode of representation. "Some societies such as north western Indian tribes have developed chain type drawings to a considerable artistic level. The drawings are not regarded as a means of communication about the depicted objects yet they incorporate a system of cues that improve their communication value. This interpretation has the advantage of being equally applicable to black South Africans, American school children.

White (1970) outlines a program for developing and utilizing special talents of exceptional individuals. Phase I concerned with identifying the gifted. Not only should one concentrate on the giftedness magnitude quotient,



which accounts for varying degrees of ability, but provisions for a talent reclamation stage should be included to salvage those who withdraw from educational programs. Phase 2 deals with educating the gifted and should offer diverse programs for different abilities. Phase 3 insures that society makes use of these creative individual and places them in the leadership roles they merit.

Elkind, et al. (1970) studied motivation and creativity. Thirty-two children were tested on three creativity measures. Each S was tested twice once when taken from an ongoing "interesting" task and once when taken from an ongoing uninteresting task". When Ss were expected to return to an "uninteresting" task they were twice as "creative" as they were when they anticipated the resumption of an interesting activity.

Otterness (1971) conducted a gifted child program for rural schools. They describe project "GO" in Hutchinson, Minnesota which attempts to program educational opportunities for gifted children in rural schools.

Speedie, et al. (1971) investigated whether effects of the Purdue Creative Thinking Program (PCTP) were persistent over time. 1,096 fourth, sixth graders were pre-tested and then instructed for 14 week with 1 of the 3 PCTP components or a combination. Two later, divergent thinking measures were administered to 450 Ss. For most treatments, no group was more significantly better than controls across the outcome variables on the



longitudinal tests. However, in the fourth grade 2 instructional components were still effective; It is concluded that short-term training (14 week) may not produce long-term changes in divergent thinking abilities.

Guilford (1971) studied some misconceptions regarding measurement of creative talent. He contends, that creative talent is not a single broad ability parallel to but distinct from general intelligence, but, like intelligence, is composed of numerous abilities. Creative performance draws upon a large number of these abilities for different purposes and on different occasions, particularly those in the structure-of-intellect model categories of divergent thinking production and transformation. A critical analysis of previous findings indicates that criteria of creative performance in everyday life are complex. It is concluded that No. 1 test of a creative ability can be expected to correlate highly with those criteria. Multiple predictions and multivariate procedures of validation are required. Criteria should be carefully examined and evaluated to insure that the wisest selection of predictors is made.

Kuzin (1971) conducted quick perception in school children in drawing from life. A new experimental method of teaching 3rd-7th graders to make rapid sketches from the life (flexible models and film loops) resulted in considerable improvement in the quality of the drawings of 498 Ss from 3 Moscow schools. Pre and Post test comparisons showed that analysis any synthesis play an important role in rapid "1st impression perception".



In comparison with cases of predominance or imbalance in favour of analysis, a balance mixture of analysis and synthesis produces the best results.

Ryder (1972) conducted a decent program in science for gifted elementary pupils. They describe a "dount" (teacher) program in which selected gifted, highly gifted, and potentially gifted 5th graders are assigned to small groups to study museum biological and physical science exhibits, and to serve as museum guides for their peer visitors.

Stewig (1972) discussed the value of creative dramatics in language development in children. It is reported to have produced significant improvement ( $p > .01$ ) in vocabulary growth and voice qualities of pupils. Other areas of language improvement associated with creative dramatics were paralanguage (defined as pitch, stress and puncture) and kinesthetics (the gestures accompanying language usage).

Johnson (1973) studied a conceptual model of teacher and student classroom interaction and observed student verbal creativity. They describe a conceptual model that was used to construct a sequential interaction category system. A Pilot Study indicates that the models can be useful in analyzing the teacher's classroom behaviour.

Halpin and Ellett (1974) administered the what kind of person are you? Test (E.P. Torrance and J. Khatena, 1970) to 360 gifted high school students in 8 academic and artistic areas. Creative personality scores were highest for the social science, art, and science groups, lowest for music and foreign language groups.



Sullivan (1974) tested 22 pupils from an open classroom and 26 from a traditional classroom for significant differences in creative thinking, creative writing, independence in decision-making, and self-confidence in a new situation. Ss in both groups were 5th graders matched for intelligence and socio-cultural backgrounds. Open-class Ss performed better in invention ( $P > .001$ ) and in fluency with words ( $P > .001$ ). No significant differences were found between the mean scores of the two groups on fluency of ideas and ability to predict outcomes. In creative-writing, open-classroom Ss surpassed traditional classroom. As in variety of sentence structure and in production of vivid passages, but not in usage of unusual words and originality of topics. Open classroom Ss were also superior in all to the eight questions in a checklist that indicated the Ss' independence in task performance. In interviews with undergraduate, open-classroom Ss were more flexible responses, more spontaneous, and less self-conscious than Ss from the traditional classroom.

Melik-Pashov (1975) tested the hypothesis that artistically gifted children are better able to show emotions through colour in painting than children who are not so gifted. The task was to colour the same outline drawing after listening to, of two versions of a story calculated to induce an emotional set with respect to the drawing. Ss were 128 children aged 6-12 years. Artistically gifted children were better able to reflect the emotional tone of the story through colours than those who were not artistically gifted. The latter subordinated the expression of emotion through colour to the



reflection of objective colours. Although the same difference showed up when the data were grouped according to the presence or absence of art training in the Ss it was much less pronounced suggesting that art training does not necessarily lead to the acquisition of the ability to express emotion through colour.

Seifert (1975) describes a technique in which music is viewed as a generative process and as a way to sharpen children's thinking skills. The program was developed through the High/Scope Educational Research Foundation, Ypsilanti, Michigan for preschoolers and elementary school children. It is reported that this approach to music education proved to be an excellent way to develop creativity and reasoning skills in children and a meaningful addition to the cognitively oriented curriculum.

Ward and Barcher (1975) examined reading achievement and creativity as related to open classroom experience. From 2nd, 3rd and 4th grade classes selected for their open characteristics, 49 children were matched on IQ, socioeconomic status sex, age and grade with 49 Ss from classrooms, identified as traditional. Reading achievement and creativity were assessed with a 2 x 2 factorial analysis of variance, open and traditional x high and low IQ. All Ss were administered the reading test and 39 pairs were viewed for the creativity measures. Both reading and figural creativity analysis showed significant main effects for 10 and significant interactions. Among low 12 groups open and traditional Ss could not be distinguished on reading



achievement or creativity. Among high IQ Ss, traditional Ss had significantly higher reading and figural creativity scores.

Liveika (1975) discusses the substances, significance, and principal types of creative skills contributing to scientific and technical progress in the national economy as well as in other spheres of Czechoslovakian society. Possible training methods of creative skills are classified into 3 basic groups: a) training methods that focus on the development of "fantasy" and thinking b) "dynamic" group methods, and c) system approach methods that are characterized by equal stress on knowledge and skill elements. In applying a creative approach, the skill of speedy and traditional reading is also significant for the creative worker; such skill can be markedly influenced by training. A relatively new field of creative skill training is represented by the use of algorithms in the training of sensorimotor as well as decision making skills.

✓ Fearn (1976) discusses the Individual Development Creativity model for use by the teachers in the classroom. According to this model creativity involves both behaviour and a capacity for being intimate with one's self. The pre-requisite for creativity is the awareness that arises from some degree of relevant knowing. Initial behaviour consists of gathering and/or isolating data to be used in the creative process, including fluency, a searching behaviour that identifies and isolates, knows and flexibility, the generation of ideas from a different and unusual perspective. A second



group of behaviours consists of data manipulation, including the discipline of internal control, elaboration, of the idea, and turning chaos into control. Creativity also involves doing things differently, a method derived from being intimate with one's own self and based on the capacity to risk. This implies the ability to explore possibilities, and imaginative thinking and originality. Risk involves making a commitment to the possibility of being different and sustaining that commitment in the face of its consequences. It is concluded that creativity occurs when the individual reaches out beyond what is established to bring an arrangement or a definition into his or her space that increases consciousness.

✓Alencar and Widlah (1976) evaluated the effects of the Purdue Creative Thinking Program (PCTP) on the creative abilities of 578 Brazilian 4th and 5th graders. At each grade level, 12 classes were assigned to each of two treatment conditions (PCTP) with or without reinforcement and a control group which had no exposure to PCTP. Pre and post-testing with the Torrance Test of Creative Thinking (TTCT) yielded twelve creativity measure. Using an analysis of covariance, the creativity training was found to be effective, but reinforcement of pupil performance appeared to have a detrimental effect.

McMullan (1976) based on a two factor conceptualization of creativity, an attempt was made to describe the complex of abilities, attitudes, and emotions that make up the creative personality. Physiological evidence of



different modes of thinking is reviewed, and two different sets of personal characteristics that describe creativity are outlined a mode of thinking that generates original ideas and a mode problem-solves is seen as oscillating between these two creative sets in the progression toward a creative solution. "Flexible Persistence" is seen as the core characteristic of the creative individual; 8 other characteristics are also seen to constitute the creative personality—delayed closure, converging diverging mindless perception, constructive discontent, detached involvement, disinterested, detailed selfishness, confident humility, and relaxed attention.

Khatena (1977) examined Torrance Creative Perception Inventory for identification, diagnosis, facilitation and research. After describing the components, reliability, validity, of the Khatena-Torrance Creative Perception Inventory (composed of the biographical something about myself and what kind of person are you? measures), its use in identification, classroom grouping, diagnosis, and program planning activities for gifted and talented children is discussed. An identification-diagnosis-facilitation model is presented in this regard. Research findings on the use of the inventory to identify creative perceptions and orientations of adolescents and adults in the US and other countries are summarized.

Weininger (1977) argues that teachers should not become obsessed with forcing some adult standards of creativity on a child and that even the most gifted child may need to imitate at times. Creativity can be



fostered by providing an external environment that supports the complex internal process that leads to creative expressions.

✓ McMullan (1977) to develop an integrated conceptualization of creativity stimulation that employs several techniques and is easy to implement, a creative idea is defined as one that is both original and feasible. The creative process is conceived as occurring in 2 stages; idea formulation and idea elaboration. It is suggested that techniques for stimulation of creativity be classified as either formulation or elaboration techniques. Formulation techniques are historically over emphasized relative to elaboration.

A creativity program of practice material for fluency, flexibility, originality, recognition and construction of a problem, combination, imagination, attention to information and arrangement and restructuring was administered to 30 male and 30 female higher school students by Heavsa and Nojtko (1978). The program had a significant effect on the development of fluency, flexibility and originality, as measured by the verbal parts of the Torrance Tests of Creative Thinking. The greatest improvement was seen in average students, followed by superior students. The greatest area of development was in originality.

Krippner and Maliszewski (1978) studied mediation and the creative process. Creativity is basically a western concept, while mediation is a practice that is associated with several eastern traditions. Some development



in humanistic/transpersonal psychology have stimulated an interest in both. This paper reviews contemporary theories of mediation and explores the relationship between mediation and creativity in experimental studies and phenomenological self-report cases. Research is needed to explain the interface between the two topics.

✓ Meeker (1978) attempted to develop a program used at enhancing creativity in children. Guilford's "structure of intellect" model is accepted as a definition of creativity. It is important to assess the creativity of children at each stage of growth and with attention to the child's immediate environment. Studies on identifying creative children are reviewed, and 10 characteristics of creative adults are mentioned. It is concluded that creativity is different in the child and in the adult. For example, spontaneity of response in the child may be the forerunner of originality in the adult. Eight suggestions for enhancing childhood creativity are given.

Mansfield (1978) reviewed the literature concerned with various techniques for training creativity that employ extended programs in a series of lessons. A number of problems associated with the research in this area are discussed. Most evaluation studies of creativity training programs support the view that creativity can be developed, but there has been only limited and inconsistent evidence of transfer to dissimilar problems.



Jensen (1978) described the development of a) a test to measure the skills of memorizing, observing and inferring, collecting data, comparing, classifying, hypothesizing, coding, summarizing, looking for assumptions, evaluating and problem solving and b) tests for research skill such as report writing, use of the library and reading various forms of data. These new tests along with the Torrance Tests of Creative Thinking were given to over 1000 1st-6th graders who spend one day/week in the Academically Talented Program (TAP) of the School District of Philadelphia. High correlations were found among segments of the new tests. Ss with IQ above 125 scored higher in research and thinking skills than those below 125, girls scored slightly higher than boys, white students higher than black students and older Ss higher than younger ones (including scores of creativity). Scores tended to increase with the length of time spent by the children in the ATP.

Meckar and Mary (1978) attempted to develop a program aimed at enhancing creativity in children. Guilford's structure of intellect model is accepted as a definition of creativity. It is important to assess the creativity of children at each stage of growth and with attention to the child's immediate environment. Studies on identifying creative children are reviewed, and 10 characteristics of creative adults are mentioned. It is concluded that creativity is different in the child and may be the forerunner of originality in the adult. Eight suggestions for enhancing childhood creativity are given.



Deltour (1978) notes that before the age of 6 years, most children are incapable of separating themselves from their 1st perception based on explanation of events. Major contributing factors are 1. non-individualized collective teaching and 2. the failure to stimulate children ~~among~~ coming from unfavoured social classes. Possible methods to stimulate creative thinking in children are described.

Rubenzer (1979) reviewed theoretical and research literature regarding right-hemisphere processing and modes of cognitive functioning. It is suggested that the right hemisphere is dominant in the interpretation and retention of nonverbal visual and auditory patterns; in processing "artistic subjects" such as music, art, dance, and physical education; in tasks that require intuitive, simultaneous, and divergent thinking; in affective responses; and in creative thinking. It is also suggested that right hemisphere functioning is dominant during certain organic states (e.g. relaxation). On the basis of the findings of the cited literature, the author offers a psycho-physiological model for promoting right-hemisphere functioning and problem solving abilities. This might be accomplished through systematic relaxation and the conscious elicitation of physiological states that are supposed to take place during each of <sup>the</sup> 4 stages that lead to problem solving.

Lalor (1979) discussed the value of leisure especially for gifted and talented persons. Several kinds of leisure are discussed: philosophical contemplative, creative and transactional. Educators are encouraged to



give prominence to these aspects of leisure in order to help shape humanity in future generations. Recommended sources of reading in the leisure field are cited.

Project REACH is a teach development program based on the theories and research of several investigators. It was applied for 3 years to the students of an elementary school and their creative development was compared to that of a control group by Juncture (1979). The creative functioning of the students was measured by the Torrance Tests of Creative Thinking and the Multiple Talent Tests administered longitudinally. After 3 years of operation, Project REACH students were statistically superior to controls in all tests. Improvement was also a function of the number of years on the project. The success of this program is attributed to the education, awareness, and involvement of both teachers and parents.

Canton, Klein and Helfat (1979) investigated the effects of the "Magic Circle" program on self-esteem, sociometric status, creativity and attitudes toward school of 111 gifted and non-gifted children in kindergarten through Grade 4. For 9 weeks Ss sat in circles with their teachers for 10-20 minutes while sharing their feelings and experiences in a nonthreatening climate. There was no significant change in self-esteem and no significant difference between gifted and non-gifted Ss on self esteem, although self esteem scores of all kindergartners increased. There was no significant finding concerning creative ability although younger Ss improved more than



older Ss. Non-gifted kindergartners' attitudes toward school become more positive but gifted 1st graders became more negative.

Czwiwinok-Jasiewicz (1979) reviewed research conducted in the US on intelligence and creativity, chiefly the controversial programs conducted by J.W. Getzels and P.W. Jackson and by M.A. Wallach and N. Kogan. The findings indicate that intelligence and creative ability are two specific mental functioning. Both should therefore be fostered in the reformed Polish School System.

Haussman and Carl (1979) addressing himself to the task of providing a conceptual framework within which creativity may be discussed, the author offers the following criteria: 1) created outcomes have intelligible structures that are irreducible 2) The structures of created outcome include are unpredictable and inherently (and usually instrumentally) valuable 3) The activities that lead to created outcomes include an element of spontaneity, so that although they are directed and controlled, they are discontinuous. It is contended that such definitional considerations are conspicuously missing from much of the literature on creativity.

LaJor and Francies (1979) discusses the value of leisure, especially for gifted and talented persons. Several kinds of leisure are discussed: philosophical, contemplative, creative and transactional. Educationists are



encouraged to give prominence to these aspects of leisure in order to help shape humanity in future generations. Recommended sources of reading in the leisure field are cited.

Kirti, Jarmila (1980) discusses teacher creativity and its reaction on education and tuition. The evaluation of pupils by her teachers and parents is also compared, and the relationship of intellectual abilities, creativity, and pupils' self-evaluation is examined. Findings suggest the necessity a) to devote new research to the field of creativity and b) to introduce knowledge about diagnosing and furthering pedagogic practice.

Rimm, Sylvia and Davis (1980) research on the Group Inventory for Finding Creative Talent (GIFT) is summarized. Forms of the test are available for primary grades (K-2) elementary grades (3-4) and upper elementary grades (5-6). Reliabilities for the forms are reported on 80 86 and 88 respectively. Statistically significantly correlations relate GIFT scores to teachers ratings of creativity and to judges' rating of creativity of scores and pictures. The correlations ranged from 0.25 to 0.54 in 11 studies. The mean GIFT scores of students in 3 schools who were enrolled in programs for the gifted were significantly higher than the mean scores of students enrolled in normal classes in the same school. Similar findings are reported in studies conducted in Israel, France and Australia.



Smith, Gudmund, J. and Carlson (1980) studied creativity in 47 4-6 year old by administering a percept genetic (PG) test, the Meta Contrast Technique (MCT), Piaget's landscape test, and a partially structured interview pertaining to play and fantasy life. Ss also made drawings and clay models. Creativity (measured by the PG test) of the older and more mature Ss. Who had also started to internalize their defensive reactions in the MCT correlated with the interviewer's and independent judges' estimates of Ss artistic products. Results show that no stable conception of reality is possible until the perceptual processes are firmly rooted in the child's inner world.

Comeau and Helen (1980) compared scores of the Torrance Tests of Creative Thinking of 32 sets of 1st and 2nd born siblings. The older siblings had significantly higher scores on the fluency, originality, and elaboration subtests, but not on the flexibility subtest. The sex of the older or younger sibling was not significant.

Ball and Torrance (1980) training work books have been developed to provide instruction in the scoring of the Torrance Tests of Creative Thinking (TTCT). To study the effectiveness of the workbook approach compared with the standard method of instruction 62 students from 2 classes in creative thinking randomly divided into 2 groups; one received the standard method of instruction, the other the workbook method. No statistically significant differences were found between the groups on the average of the 5 TTCT standard scores. The number of creative strengths identified on the creativity



index. The scores of the members of the 2 groups related similarly in criterion measures. It is concluded that, for this group of graduate students the two methods of instruction were equally effective.

Hollie (1980) points out that in California there is a large students population whose environmental, cultural, language, and economic background differs significantly from the predominant white middle class on whom standardized tests are normed. Among these students are bound to be mentally gifted children who are underachieving scholastically. How these children are identified and provided for educationally are discussed.

Milgram (1980) points out that there are a large number of formal and informal programs of special education for the gifted in Israel today, largely due to efforts of advocates who view the gifted as one of the nation's most important resources. The author reviews research on the gifted and discusses the development of creative thinking.

Dirks and Quarforth (1981) compared and contrasted 2 type of multiple criteria models that can be used to select children for gifted classes: breadth and depth models. In the breadth model, children are selected for gifted classes if they score moderately well on several assessment areas simultaneously. In the depth model, children are selected for gifted classes if they score superlatively well on any one assessment and regardless of the level of their performance in other assessment areas. In the present study three breadth models, three depth models and a more traditional intelligence



test model were applied in 149 white 4th graders. Results indicate that Ss selected by the breadth models had high classroom grades and were well thought of by their teachers. However, depth models included more Ss with unusually higher IQ scores and more promising underachievers than did breadth models; these and other factors made depth models more advantageous than breadth models.

Chetelat (1981) discusses 3 objectives to be considered when implementing a gifted program in art; 1) identifying students who are gifted in the visual arts, 2) establishing specific objectives in working with gifted children and 3) assessing and evaluating student progress. Five factors that distinguish the gifted student in art are fluency of imagination and expression, a highly developed sensibility for spatial distribution and organization and intuitive quality of imagination, directness of expression that manifests itself when an experience is in tune with child's desire to express it visually, and a high degree of self-identification with subject matter and medium. The development of a program for establishing a gifted art curriculum at an elementary level is discussed, the aim of which was to provide a highly interesting and challenging visual arts program for the gifted within the regular art classroom. Methods used to identify gifted students included observation, nomination forms from the art teacher and parents, and portfolios of artwork. One strategy used for the gifted within the art classroom was a station learning experience whereby the gifted child



investigate the visual arts concepts that their classmates were learning, but with an emphasis on exploring the concepts in a more individual, independent, and accelerated manner.

Delisle, Reis and Gubbins (1981) studied the Revolving Door Identification Model which offers a systematic approach to identification of and programming for gifted students. Conceptually, the model relies on the review of literacy by J.S. Renzulli (1978). The application of this body of literature to implementation of the model in all Torrington, Connecticut Elementary and Junior High Schools was investigated during the 1980-1981 school year.

Thomas and Berk (1981) examined effect of 3 types of school environments-informal, intermediate and formal-on changes in figural creativity over the school year for 225 1st and 2nd graders. Children and their parents responded to the Thinking Creatively with pictures subscales of the Torrance Tests of Creative Thinking, and teachers completed the Behaviour Rating Scale. It was hypothesized that school settings rated intermediate on a formal-to-informal continuum would lead to the greatest growth in creativity. Results support the hypothesis, although girls profited from intermediate and informal environments more than boys. In contrast to previous research, teachers, teachers tended to view creative children positively and as well adjusted to the classroom.



Clements (1981) discussed the creative and mental development of architect F. L. Wright through intensive childhood creativity training, carried out by his mother's use of F. Froebel's building block curriculum. Implications for gifted education are the use of manipulable learning devices, an emphasis on relatedness, and the role of aesthetics in promoting creative development.

Caesar's (1981) review of creativity research in psychology for the last 30 years describes the following aspects: the social background of creativity research begining with the creativity boom" in the 1950's some problems of experimental in creativity research, and the possibilities for testing five abilities. This article focuses on the relationship between creativity research and research in child development, the importance of creative stimulation on the development of thought, the social and emotional behaviour of children. Some creativity programs for preschool and primary education are to provide background for professionals working in field. Most of the literature is based on Anglo-American indicating the lack of research in the Federal Republic Germany and the need for more investigation.

Feldhusen (1981) examined teaching gifted, creative and talented students in an individual classroom. The author describes her efforts to individualize classroom instruction in a regular classroom setting to meet the needs of gifted, creative, and high ability children. The program is



centered around the development of learning centres, such as library centre and a math learning centre and individualized learning materials.

Rimm, Davis and Bien (1982) summarized research carried out using 4 inventories developed by 2 of the present authors (Rimm, 1976 and 1981 ; Davis and Rimm 1979 and 1982) for elementary and secondary students for programs for the creatively gifted. These instruments are GIFT: Group Inventory for Finding Creative Talent: GIFT I and II ; Group Inventory for Finding Interests (inventories for junior and senior high school students) and PRIDE. Preschool Interest Descriptor (a preschool and kindergarten parent report inventory). It is concluded that these "characteristics" approaches, which evaluate psychological, personality, motivational, and biographical traits that usually characterize highly creative people, seem to be an efficient and effective method of selecting creative students for gifted programs when combined with at least 1 other method. In addition to selecting the obviously creative child, they appear to be successful in identifying the underachieving and culturally different child.

Delisle (1982) developed and used the Revolving Door Identification and Programming Model, which allows for the identification of children with above average (but not necessarily superior) abilities for the purpose of providing resource room services at some point in the school year, depending upon expressed students' need for enrichment opportunities. Ss were 378 students in Grades 1-3, 614 students in Grades 4-6 and 129 students in



grades 7-8 who were identified as being in the top 15-25 percent of their school's academic rank. Ss were further classified by class rank into 2 groups. The traditional group consisting of Ss in the 95th percentile of the student population and the expanded group consisting of Ss in the 75-95th percentile. Ss were administered the Intellectual Achievement Responsibility Questionnaire, to measure expectancies for internal Vs external control in an academic setting and the Self-Appraisal Inventory. Results of stepwise discriminant function analysis revealed several independent variables as significantly effective predictors for revolving into the resource room: class rank academic self concept, and locus of control. It is concluded that a high rank in class, while being an effective predictor of resource room involvement, misses a substantial proportion of students who function effectively on an independent basis, despite their less than superior achievement.

Lowery (1982) examined 12 gifted students (IQ 120 or more on the Otis-Lennon Mental Ability Test) from each of the 3rd, 4th, and 5th grade levels were randomly assigned to 1 of 3 treatment groups. Each received 60 minutes of weekly creativity training for 6 weeks after which the Torrance Test of Creative Thinking - Verbal Form A and Figural Form B were administered. The 3 treatment groups consisted of the following: 1) a packaged activity sheets program, New Directions in Creativity Basic (NDCB) ; 2) New Direction in Creativity Enhanced (NDCE) which also included teaching suggesting and follow-up activity x3) music and imagery (MI) lessons consisting of a guided



fantasy trip with appropriate background music, after which students discussed their impressions. Results suggest that MI may be a more effective instruction method for increasing creativity than either NCDE or NDCE. Although there was no significant difference in the treatment means of MI Ss' creativity scores for any of the figural tests except figural originality. MI Ss' means were arithmetically greater than the means of the other 2 groups on figural fluency, figural flexibility and figural elaboration.

Cellerino (1983) described the mentor component of a school program for the talented and gifted that is based on 2 innovative models that encourage involvement on the part of students and resource people. Voltmeter mentors act as advisers, consultants, specialists, and sometimes critics until students have fulfilled their own goals. Students are exposed to a wide variety of topics, and resource teachers and mentors enable children to understand the process of their own learning.

Zelina and Buganova (1983) suggest possibilities of how to utilize theoretical knowledge of creativity in the teaching process in the Czech Educational System. Creativity is defined, and concrete possibilities are offered for Slovak language lessons that develop student creative perception, fantasy, abilities and problem solving. The formation of characteristics of creative personality and production of a creative classroom atmosphere are further components in the development of creative personalities.



Dover (1983) discussed the history of the use of computers in gifted education and reviews the advantages of creative computer environment in gifted education. A review of the literature indicates that working with computers appears to enhance self-confidence and curiosity, stimulate exploratory behaviour and motivation, and foster positive attitudes toward learning. One of the benefits for teachers of the gifted occurring from the use of computers includes the potential for enhanced relationships with the students. Computers have the capability to free teachers from mundane tasks, permitting them to engage in analyzing children's needs, design optimal educational environments, and arrange appropriate learning experiences for their students. Also, the cost reduction offered by computer instruction is an important justification for its widespread application with the gifted.

Colangelo and Kelly (1983) conducted gifted/talented (GT) program and 204 general studies (GS) students in the 7th-9th grades, 12 of their teachers, and 42 of their parents completed a questionnaire on school activities (extra curricular and GT) to assess student, teacher, and parent attitudes toward gifted programs and gifted students. The questionnaire assessed the importance of each school activity, degree of participation students would like to achieve in each activity, and degree of liking. Ss felt for students already participating in each activity. Overall, result indicate that the GT program was perceived to be as valuable as other academically oriented programmes. However academically oriented programmes



were not seen as being highly valuable to the school. The attitudes of GS Ss toward GT Ss was neutral. GT Ss expressed significantly more favourable attitudes toward the GT program and other GT Ss than did GS Ss.

Dole and Adams (1983) examined results of a survey of 99 national and state leaders in the fields of both education for the gifted and reading education indicate that 1) a reading curriculum for gifted readers is not vastly different from a developmental reading curriculum 2) although some differences exist, gifted educators and reading educators basically agree on the reading curriculum components needed by both gifted and non gifted students and 3) there is a great need for assisting teacher in gaining increased effectiveness in instructing gifted readers.

Trostle and Yawkey (1983) contends that using objects to enhance of a youngster's creativity results in growth imagination, adaptive thought, social skills, cognitive functioning, and understanding of the external world. The caregiver (parent or teacher) must integrate the child's internal reality, motivation, and control in the context of a supportive, rich and varied environment.

Harvis and Bawer (1983) discussed the PAL (Potentially Able Learners) Program, which was instituted in the Rockford Public School District in 1975 for preschool age potentially gifted children and their parents. The PAL program integrates concern for gifted education, parent involvement, and



preschool training. Components of the PAL program include activities for developing parent group interactions, parenting skills, home learning experiences, and introducing the parents to school.

Renfrow (1983) attempted to establish evidence that trained gifted children, aged 8-11 year would draw more realistically than untrained gifted children. 36 Ss were randomly assigned to an experimental or control group. 18 lessons in perception and drawing were presented over 9 weeks to the experimental group while the control received 18 lessons in traditional art program. Two sets of drawings from each group were rated independently by 2 raters. The drawings were rated for degree of realism on a 5 point scale for each of 4 criteria. An ANOVA that compared the mean scores of the experimental and control groups indicated that a significant difference existed between experimental and control groups. A 2nd ANOVA analyzed the mean gain scores; a significant interaction between age and treatment was found.

Parke (1983) examined the effects of a 10 week self-instructional mathematics program on the mathematics achievement of high achieving primary students - 5 kindergartners, 8 1st graders, and 9 2nd graders. A high achieving comparison group consisted of 22 aged matched Ss, and a random comparison group had another 22 age matched Ss. A 170 item assessment instrument testing skills mastered was administered pre and post test. Ss



taught with the experimental self instructional system showed the greatest gains in post test scores in all mathematical areas instructed.

Taylor and Ellison (1983) describe a newly developed form U Biological Inventory that measures 4 indicators of gifted/talented abilities (academic performance, creativity, leadership and artistic potential) and is consistent with the conceptions of gifted and talented attributes advanced by the US Department of Education (USDE). The background of the test's development and use and implications for its application are discussed. Advantages of the test include similarity to IQ tests, prediction of college and graduate school success, racial, fairness, and economic feasibility.

Degn (1983) combining the theories of such authors as I.A.Taylor (1959) and E.P. Torrance (1965, 70 a model of creativity was constructed that underlines the components of the concept, the creative process, and the level at which the process function. Questionnaire results from 484 Danish students and teachers differed from those obtained by Torrance. So most of all wanted their teachers to express themselves clearly and to be reasonable, patient, and helpful, and easy to talk to concepts such as A.H. Maslow's (1954, 1968) needs hierarchy. The use of alternate modes of instruction based on experimentation and problem solving is also considered.



Renzulli (1984) discussed four major issues concerning the evaluation of the programs for the gifted: a) the need to evaluate gifted programs in the areas of planning, development, and accountability 2) the evaluation of practical as well as educational issues 3) the need for diagnostic evaluation this is specific to a particular program and 4) recognition that conventionally standardized tests are unsuitable for assessing "high-level-objectives".

Dubner (1984) studied the IMPACT program designed to give gifted students the opportunity to participate in educational experiences commensurate with their interests and abilities. The program is designed to encourage students to direct their own learning experience, involve community resources, and foster leadership skills and social conscience. Special features of the program are described, and an evaluation study is reported that showed significant increase among 358 students in thinking Introversion, Estheticism, and Altruism subscales of the Ombibus Personality Inventory.

Meyers (1984) studied a survey of 52 teachers concerning a resource room program for gifted students. The study showed that they needed to give extra time to these students, that there was not sufficient time for communication between teachers, and that Ss concerned about the selection criteria regarding the mastery of basic skills. Recommendation for improving teacher involvement and communication, selection and scheduling procedures and student performance are presented.



Daniels and Parks (1984) conducted a survey of 101 administrators of school programs for the gifted to determine their level of support for these programs. Findings indicate that Ss had generally favourable attitudes about gifted education but had mixed feelings about the overall effect of the programs and the delivery system used. Critical thinking, research and creativity were emphasized as meriting special focus in gifted programs, while affective development, academic strategies any psychomotor experiences were seen as of less significance. Classroom teachers were seen as more effective developers of an Individualized Education Plan than administrators. Overall findings indicate a great disparity among Ss in the level of knowledge and attitude toward gifted education. Implications for programs unity and implementation are discussed in this context.

Gregory (1984) discussed a search for exceptional academic achievement program designed to differentiate among junior high school students who ranked academically at the top of their classes. It is asserted that academically outstanding students need more difficult achievement tests than their classmates. 450 junior high school Ss were administered the Washington Precollege Test which is normally administered the high school junior and seniors to determine placement. Comparisons of Ss' scores with standardized group of high school students showed that Ss' scores were comparable, and in some cases, superior to those of the high school students. Examples of advanced follow-up programs for high-scoring Ss are presented.



Schichter (1984) provided a selective annotated bibliography of fiction and non-fiction books to assist gifted youngsters in pursuing their interests. It includes books to help students explore an identified interest with greater depth and breadth, as well as books to stimulate new interests. The books are identified in terms on a specific conceptual model for gifted education, the enrichment triad model of J.S. Renzulli (1977) but can be used, in any program that focusses on the encouragement and development of student's interests.

Semyonova and Lukashevich (1984) hypothesized that creation of an "altruistic" mode of adult-child interaction, in which all the adults exert no influence over the child's behaviour creates an atmosphere in which the adults' introduction of new elements into an activity influences positively the development of the child's creative initiative. A group of 6-7 year olds had 4-5 classroom training sessions per week in which they gradually added to the performance of the task. A control group had the same program without the altruistic adult. Ss' creative initiative-defined as the ability to add new elements to a given plan of activity was measured before and after training by tests of circle drawing, applique making, and figure drawing. The general and creative productivity of the experimental group increased significantly above the baseline and relative to the control group. It is concluded that creation of an altruistic mode of interaction between children and adults aid in the development of creative initiative in children.



Mangieri and Madigan (1984) administered a 14 item questionnaire to educators in 150 school districts throughout the US, which focussed on topics dealing with the teaching of reading to gifted students. Results include the following : 1) A key focus on reading programs for gifted students was enrichment 2) when selecting children for a gifted program, teacher recommendation were of paramount importance 3) There was an extremely high degree of communication reported between schools and parents of gifted children. Suggestions are offered for instilling better reading attitudes in both gifted and non-gifted students.

McAleer (1984) described the TIE challenge model that provides them with opportunities for learning that emphasize exploring, experiencing, and expressing. The 3 TIE components-themes, interacts, and explorits-focus on the development of creative thinking behaviour, the higher levels of Bloom's taxonomy inquiry techniques, creative problem solving, group dynamics, and the encouragement of the student's self concept and sense of responsibility.

Kirschenbaum (1984) compared enrichment and acceleration approaches to the programming for the gifted, focusing on how each approach view questions concerning who are the gifted and how they are best educated. Acceleration emphasizes the development of specific cognitive abilities, while enrichment is aimed at helping students with certain personality characteristics to organize their abilities into constructive and creative products. The debate



over the "revolving door identification" model by J.S. Renzulli (1981) is used to illustrate the differences that exist between proponents of enrichment and acceleration programming models.

Fearn and Orven (1984) described Project SPRING (Special Program Responding to Intellectual Needs of Gifted), which is designed as an assessment and intervention process similar to that characteristic of current special education programs. Objectives and enabling activities appropriate to individual students were determined and written on the basis of present level of functioning. At the end of 3 years, the project readministered an intellectual abilities assessment from which data were collected. This demonstrated the feasibility of individualized instruction.

Schwartz and Fischman (1984) described Project PATS (Potentially Academically Talented Students), a state-funded, tri-level pilot project for middle school students. The initial tasks in setting up Project PATS included enlisting criteria to identify potentially able students, planning college level programs for enriching the potentially able and the identified gifted, and evaluating the program as it proceeded. The interactions among the administrators from school districts and the college where the course were to be given and the PATS staff members are discussed. Factors critical in the success of the project are identified and areas in which mistakes made are outlined.



Van Jassel-Baska Joyce (1984) described the talent search identification model, developed by W. Foster (1979) which is a standardized approach to the screening, verification, and placement of gifted and talented children. The model identifies junior high school students who have already scores at the 95th percentile or above on standardized achievement tests; it also uses the scholastic aptitude test as a 2nd level test to determine mathematical and verbal ability. Steps in the establishment of a talent pool and guidelines for score discrimination on various tests are discussed.

Bruce (1984) discussed recommendations made in the report by the National Commission on excellence in education (1983) entitled a Nation at Risk; The Imperative for Educational Reform for programs for gifted and talented students. It is asserted that concern for overall educational reform must not overshadow the needs of gifted students. Among these recommendations are the development of appropriate texts; the upgrading of teachers personnel the allotment of additional time beyond the conventional school day or year to meet the needs of the gifted; and the implementation of placement, grouping, promotion and graduation policies determined by student academic progress and instructional needs, instead of by rigid age or grade expectations.

Wallen (1984) presents practical guidelines for the devising of curriculum extension activities for very able pupils and gives examples of the principles put into practice at infant, junior and secondary levels.



A series of projects prepared by groups of teachers in Essex, England, are presented as possibilities for curriculum extension. These include such projects as working with ~~dinosaurs~~, working with early man, and learning about weather, pollution and genetic engineering.

Taylor (1984) reviewed studies of the characteristics of significant scientific contributions, types of productive thinking, and the implications of this research for the design of educational program that foster creativity and excellence in students. The need to achieve a balance between conventional and creative excellence is examined with reference to the system of education in Venezuela and to A. Toynbee's view of history.

McDowell (1984) reviews research to support the existence and frequent occurrence of social and emotional problems in gifted students. Tantamount to the importance of the social problems that gifted students are confronted with is the critical issue of emotional disturbance and giftedness. It is suggested that the mentally gifted students may actually be more inclined to experience emotional problems than the child of average intelligence because the gifted student more actively interacts with his/her environment, thus increasing the chance for the occurrence of more conflict. Compensatory interventions that can be instituted in the school and home environments to facilitate the social and emotional adjustment of the gifted student are discussed; these include the modification of the educational environment through a proactive, approach, coordinating the accelerated abilities of the academically gifted with other aspects of their development



and providing personal and group counselling sessions for both gifted and non-gifted students. Establishing meaningful relationships between educators and gifted students can be a critical step in achieving individual responsibilities and in developing skills and concepts toward the gifted person's higher capacities. It is suggested that when critical social and emotional factors are addressed with diligence and alacrity, gifted students can bring their abilities into harmony with living and lead productive self fulfilling lives.

Delclos, Bransford, and Haywood (1984) described an 'instrumental enrichment (IE) program that consists of 15 curriculum packages made up of paper and pencil-exercises, providing materials for 1 hour lessons 3-5 times a week for a period of 3 years. The exercises are systematic guides to creative teaching. Each instrument focuses on a specific cognitive deficiency and provides experience in overcoming it. The essential features of IE are outlined and it is demonstrated how seemingly insignificant tasks, such as connecting dots, can be used to encourage and develop thought. Suggestions are made for evaluating the effectiveness.

Sloan and Stedtnitz (1984) discussed why the enrichment triad model (J.S. Renzulli, 1977) needs to be adapted for a preschool/primary setting and provides suggestions for educators on how to do this. A real life example of a 5 year old boys who successfully completed a Type III



project is presented. The role of the teacher in understanding how a young child's social, physical, academic, and emotional development can influence appropriate programming is emphasized.

Gratz and Pulley (1984) studied gifted and talented program for migrant students. They describe a program for 37 gifted and talented migrant students in grades 9-12 that was taught by university professors in a high school in Texas. Supplemental instruction in English, Mathematics, Science, or Social Studies was available. Although achievement test data did not indicate significant gains in cognitive learning, a high degree of improvement within the effective domain was indicated by student self-evaluation after one year of operation.

Dorhout (1984) described a symposium for the arts which serves artistically gifted students and offers them an opportunity to work with professionals in the arts on a hands on basis. As a result of comparison of pre and post test attitudes toward the arts among 115 6th-12th grades who participated in the symposium, it was found that a statistically significant positive change in attitude toward the arts, occurred.

Kulm (1984) studied geometry enrichment for mathematically gifted students. They described a summer course for mathematically gifted 8th graders. Pretests showed that Ss had mastered basic geometric terms but not axiomatic approaches. A problem-centered approach was used to develop



abilities to hypothesize and carry out informal deductive proofs. Ss worked best independently; they tended to be impulsive thinkers but were able to reflect and develop more general results when required. It is suggested that geometry provides an excellent context for developing intuition, reflective thinking and deductive reasoning abilities.

Roberson (1984) contends that attempts must be made to design a broad knowledge-centered curriculum framework to aid the teacher for the gifted in selecting and developing content material relevant to today's needs. Traditional disciplines can be organized so that content areas give information about tools of understanding, messages and meanings, companions, culture's evolution, the need to create, environmental awareness environment enviro mastery and improvement, and unique and individual needs and interests. This reorganization leads to selection of appropriate content, methods, and instructional materials to cover mastery of learning skills, philosophical foundation, history and evolution of ideas, conceptual framework, practising methodology, application and environment relevance, related issues and trends, and advanced and independent studies. It is suggested that although gifted learners need structure it must be open to new and pertinent ideas.

Gray, William (1984) described how preservice teacher provide indirect mentoring (by drawing on the expertise of professionals and people in the workforce and community) and direct mentoring (by sharing their own



expertise directly with 2,4 proteges) in order to provide an effective delivery system for J. Renzulli's (1977) widely employed "enrichment triad model". Guidelines for implementing the mentor, scheme are outlined in the "4-phase mentoring model" and the "helping relationships model".

Kinsey, Anthony (1984) proposes that art should be an essential experience for gifted individuals, since it encourages creative expression through visual language. It is argued that the quality of a drawing depends on the material available to the child and the expectation of the adult supporting the activity. Drawing is a very malleable means of responding to and developing thoughts and children's drawings should be encouraged and appreciated from their earliest attempts to express idea. Examples of children's art are included.

Ostrom (1984) asserts that imagery is the key to counselling gifted, talented, and creative persons because of their ability to visualize an objective and act on that objective with a goal in mind. Drawing, writing and dancing techniques designed for guided imagery workshops are outlined. Images of love, power and purpose, leading to the depiction of the "radiant self" are described.

Baker, Joanne, E., and Winston, Andrew, S. (1985) in two experiments examined whether self-instructional training, rather than reinforcement, could be used to modify, complex dimensions of children's drawing and story telling.



Social validation was used to examine the significance of these dimensions in determining subjective judgements of creativity. In a multiple base-line design, self-instructions were used to increase diversity of representational content and subjective ratings of novelty in the drawings of six normal five and six year olds. Story telling was examined for cross-task generalization. Diversity in the stories increased only after explicit training. Two adult judges gave significantly higher creativity rankings to drawings, but not to stories with increased representational diversity. Drawing that receive high ratings for novelty of content were judged significantly more creative than those given lower novelty ratings.

Bickel, Frank (1985) studied whether gifted children differ in their understanding of Piaget's (1927, 1969) time/velocity inversion, which suggests that at approximately 10-12 years of age children begin to understand that greater velocity results in less elapsed time of an event. A series of musical tasks was presented individually to 38 gifted and 38 non-gifted fifth and 6th graders. Chi-squares tests applied to frequency data from the musical and metronome tasks revealed differences in the groups' responses to musical task. Gifted Ss at both grade levels gave more detailed and varied responses than non-gifted Ss. Comparisons by grade level. However suggest a levelling off of the development of the time/velocity comprehension from the 4th to the 6th grade.

Karnes et al. (1985) described the University of Illinois Program for Young Gifted Children (PYGC) that is based on the combined use of two



instructional model the open classroom an instructional model derived from J. Guilford's (1967) structure of the intellect. The overall goals of the PYGC are to help children make sense out of their own experiences, environment and feelings, to equip them with basic learning skills as tools for exploring, observing, describing and organizing their experiences; and to help them develop the knowledge and emotional resource that will strengthen and enhance their strength of dignity. Recruitment and identification of children eligible to participate in the PYGC and characteristic of the differentiated curriculum are discussed. The program's approach adheres to 5 basic principles: learning involves acting on the environment, is developmental accustom the child to decisions, integrates knowledge and is based on dialog. Characteristics of the classroom environment, the teacher's role. Children's activities and the importance of parent involvement are highlighted.

Stovell (1985) compared the effectiveness of an established system for teaching creativity developed by F.W. Williams (1972) with a method by R.H. Williams and J. Stockmyer (1985). The 1st method features a training model that focuses on both the affective and cognitive realism of creative; the 2nd includes specific strategies that teachers can use to enhance creative thinking across 6 major subject areas. Ss were 58 6th graders from 3 class rooms. Two classes were experimental and used 1 of the 2 systems, and the 3rd class serves as a control. Results suggest that both of the methods can be effective means of teaching children the skills of creative thinking and that the William Stockmyer method may be superior to the F.W. Williams approach in achieving this end.



Bogue and Wolf (1985) described an enrichment program for gifted students in grades 1-4 that was a joint effort of school personnel, community members, and parents. Programs were offered after school that focussed on activities emphasizing analysis, synthesis and evaluation rather than the amassing of knowledge based on evaluation questionnaires completed by 52 parents, it is concluded that the program was successful in providing enrichment experiences to gifted students.

Jansovec (1985) studied a comparison of EEG and YSOLAT measures. Sixteen high-or-low creative 9 years old completed the Your Style of Learning and Thinking (YSOLAT) a measure of hemispheric preference. EEG results obtained while Ss performed greater hemispheric integration in high than low creative Ss showed right hemisphere asymmetries. YSOLAT results were opposite to those obtained with EEGD. More right hemispheric answers were chosen by high than low creative Ss. Differences between the two measures suggest that YSOLAT responses may be influenced by conformity-non-conformity choices.

Ekmeier, et al. (1985) studied an empirical comparison of two program models for elementary gifted education. 163 students in grades 3-6 who were identified as gifted based on their scores on the Otis-Lennon School Ability Test and teacher recommendations were randomly assigned to 2 groups: Group 1 participated in a specially designed curriculum (the higher level thinking skills (HLTS) Program) developed by the authors to



improve Ss' ability to analyze, synthesize, and evaluate information and Group 2 subsequently completed 8 weeks of similar training. On termination of the program 8 weeks later, both groups completed the Ross Test of Higher Cognitive Processes. At the end of the 1st session, Group 1 consistently out performed Group 2 but by the end of the 2nd session, both groups were identical in performance. A 2nd study assigned gifted students from grades 1-6 to an HLTS program taught by gifted specialists and similar Ss to an HLTS program taught by volunteer teachers using a structured program in the regular classroom. Results show that the volunteer teachers were equally as successful as the gifted specialists in increasing academic achievement.

Cartev and Hamilton (1985) described an evaluation process and mode that was developed by the authors to assess the effectiveness of programs for gifted and talented students. The model contains 2 approaches: 1) A process oriented evaluation defines essential program components and standards of acceptance, and 2) an outcome oriented evaluation assesses components via student outcomes. It is emphasized that, in this age of accountability, it is no longer sufficient to subjectively determine that gifted and talented programs should continue to exist.

Callierino and Story (1985) described an elementary school program that followed the revolving door identification model of J.S. Renzulli, et al. (1981) which views giftedness in terms of behaviour. The program was also based on Renzulli's (1977) enrichment trait model, which outline three types



of activities (general exploratory activities, group training and investigations of real problems) that encourage different levels of involvement of students. The program was activated in a 4th grade class room and was used to bridge the gap between the resource room for gifted children and the regular classroom.

Venter (1985) presents a personal account of the development of an enrichment program for gifted students age 6-9 years in South Africa. Enrichment activities relating to topics such as the evolution of humans, color, volcanoes, and space are discussed, and 3 examples of students' art and creative writing are presented. It is concluded that parent involvement and the exposure of children to experts within the community for enrichment are extremely important aspects of the enrichment program.

Smith and Carlson (1985) investigated the development of creativity (the inclination to transgress the confines of an established perceptual context) in 142 youngsters (aged 12-16 years). At least/parent of more than half of the Ss was a college student (academic background). Ss were tested with a percept-genetic creativity test, a creativity-fantasy scale, and a percept-genetic personality test. Results indicate that after a creative peak among 10-11 year olds, 12 year olds showed a significant decrease of strong creativity signs, a simultaneous increase of compulsive and kindred defense strategies, and a decrease of signs of anxiety. The recovery of creativity was slow during high puberty (14-15 years) but more marked after (16 years). Using the duality of inwardness and the outside world as a point



of departure, the present authors discuss the fluctuations between high and low creative periods and explain why they were more pronounced among Ss with an academic home background.

Caldwell, Sarah, T. (1985) examined the reading abilities of early readers, using 24 highly gifted preschoolers who were screened for reading ability 13 readers and 11 non readers were compared. Readers' scores on selected subtests of the Durrell Analysis of Reading Difficulty were correlated with measures gathered for program admission. Results of a subsequent investigation of basal reading texts teachers' editions for suggestions for differentiating instruction for early readers are reported in terms of the needs of gifted preschoolers.

Stambak, Mira and Royon, Christiane (1985) reported on part of a larger project aimed at showing the prime importance of social relations in the development of knowledge and the need to define educational situations that favour the free play of these interrelations. The processes used by a 3 year old children whom in pairs, created and improvised puppet shows within the setting of their creche and analysed. The improvisations of Ss who had watched, puppet shows performed by adults, show that they had a good mastery of the organizational frame work of such shows, that they used a wide range of themes, and that they sought coherency and rigor. Coherency came from the use of processes that were outlined by the construction of the



p) (classifications, explanations, requests for more precision-jurisdiction, opinions, judgements, provocations, challenges; and generalizations) and inferential processes that structured the development of the theme.

Wood, William (1985) suggests way for classroom resource room or music teachers to address the musical needs of the gifted or musically talented students. A 6 step planning model for teaching strategies is proposed that includes evaluating the student's musical talents, interests, strengths and needs, determining the most effective musical environment possible for the student, exposing the student to a variety of possibilities within the field of music; helping the student to select a project; assisting in the location and selection of resources; and guiding and supervising the activity.

Sparrow (1985) advocates an individualized approach to teaching gifted children. It is suggested that the teacher can make much progress towards meeting the needs of all pupils, including the most able, by providing students with open-ended problems that can be confronted on a variety of levels. Ideas designed to enrich the curriculum of gifted students (eg. research using community resources, computer activities to decrease boredom, activities that teach children to capitalize on their creative talents) are presented.



Johnson, et al. (1985) described the Montgomery Country (Maryland) Public School's Program for the early identification of talented and gifted minority students who are often overlooked because of socio-economic, cultural or linguistic differences. The validation of a batter of instrument and techniques to identify gifted students among 130 2nd and 149 3rd graders not previously identified as gifted and talented is outlined. Instrument to measure the project's instructional objectives, as well as, informal measure of perceptions of PADI, overall program effects, specific cognitive behaviours and affective behaviours, are described. Preliminary data indicate that PADI student experienced growth in self-concept and thinking; a number of these students were identified as gifted and talented.

Wallam (1985) advocates the development of curriculum extension programs, set within the existing human and material resources of each school, to meet the immediate and specific needs and interests of pupils. Emphasis is placed on provision with due emphasis on labelling during identification procedures. Meeting the needs of exceptionally able pupils is seen as an aspects of providing opportunities for all pupils to develop this potential.

Bell (1985) focuses on the use of a specific technique for evaluation of the implementation of a curriculum innovation in a Canadian gifted/enrichment program. A profile that enables teachers to examine



their philosophy, the quality of resources, teaching strategies, and student objectives is suggested and guidelines for use are summarized.

Long and Hiebert (1985) explored the relationship between mental imagery and the ability to write creatively and originality, using 43 gifted children in grades 3-6. 19 Ss were in an experimental group and 24 in a control group. Measures included a test of divergent thinking. A story sample was obtained from all Ss at the begining and end of the study. Guided instruction in imagery improved the quality and quantity of writing of the Ss.

Malathy (1986) discusses educational provision for 39 gifted pupils in a Local Education Authority in England and explores the difficulties of differential grouping, acceleration, and enrichment in addition to the problem of the variety of teachers' interpretations of the three provision types. The importance of developing teacher skills and individualized curriculum within the necessary organizational structure is emphasized.

Bender (1986) discussed several major paradigmatic approaches to special education used during the past decade as models for education as a whole. These approaches include the value of individualization, the focus on relevant basic skills, attention of teaching/learning strategies, responsiveness to research issues, and a shift toward early education.



Wallace (1986) discussed creativity as involving thinking, intuition, feeling, and sensing. To achieve fulfillment, the highly creative personality is seen as needing a framework of self-understanding positive encouragement, and acceptance to balance the rational and irrational components of the creative personality. The creative process is regarded as the reconciliation of conflict between detachment and commitment, passion and decorum, immediacy and referral, and masculinity and femininity. Ways in which teachers can promote a classroom environment in which children can flourish creatively are described.

Bruch (1986) presents a system for fostering creativity in students and in their adult mentors—the Creative Characteristics Models. The system is based on principles of general systems theory and on research and literature above creative persons and their behaviours. These models characterize creative tendencies from early developmental stages through later life found in persons who make significant original break throughs. Applications of the models may be developed by teachers as a means of integrating creativity into any curricular area.

Cornell and Grossberg (1986) tested the view that placing a child in a gifted program could adversely affect the self-esteem or personality adjustment of siblings not so placed. 15 regular classroom children were compared to their gifted program siblings and to 12 children who were placed in gifted program along with their siblings. The gifted Ss were 7-11



year old, and their siblings were 6-16 years old. Based on data from several parent and child report measures of personality, self-esteem, and anxiety, adjustment problems were found to occur primarily in regular classroom children who were perceived as less gifted than their siblings by parents. Results have implications for counselling parents who choose to place one of their children in a gifted program while a sibling remains in a regular classroom.

Kitano (1986) discussed criteria for the placement of gifted children in appropriate programs. Program features to consider include the population served, administrative, arrangements (enrichment or acceleration) academic and social goals, philosophy, management plan, monitoring system, specialized activities and materials, opportunities for individualization, parental involvement, degree of structure or flexibility, and continuity with other programs. Important characteristics to be assessed in the child include the degree and areas of advancement, tolerance for individual differences, adaptability and social and emotional maturity.

Van Tassel-Baska (1986) presents an historical perspective on the evolution of 3 curriculum and instructional models that have been shown to be effective with gifted learners in various contexts and at various grade levels. Consideration of all 3 models the content mastery model, the process/product research model, and the epistemological concept model in a comprehensive program for gifted learners is encouraged.



Cornell and Grossberg (1986) tested the view that placing a child in a gifted program could adversely affect the self-esteem or personality adjustment of siblings not so placed. 15 regular classroom children were compared to their gifted program siblings and to 12 children who were placed in gifted programs along with their siblings. The gifted Ss were 7-11 year old and their siblings were 6-16 year olds. Based on data from several parent and child report measures of personality, self-esteem, and anxiety, adjustment problems were found to occur primarily in regular classroom children who were perceived as less gifted than their siblings by parents. Results have implications for counselling parents who choose to place one of their children in a gifted program while a sibling remains in a regular program.

Sawada (1986) contends that emergence of order in an open system is a spontaneous happening that can be destroyed easily by the dominant social forces serving the interests of control. Creativity is viewed as emerging order. Discussed are metaphors for emerging order, current practice in classrooms, and the choice of teachers to become participating members in communication process or agents of social control.

Tuckman and Hinkle (1986) compared the effects of running to those of the normal physical education program among 154 4th, 5th and 6th graders who were randomly assigned to conditions. The running program



consisted of 3 30-minutes sessions per week for 12 weeks in lieu of attendance in regular physical education classes. Findings show that although boys tended to run faster than girls overall and that older children ran faster than younger children and performed better on 800 minutes run, had lower pulse rates and performed better on a test of creativity than did regular physical education participants. Running was judged effective for enhancing the cardiorespiratory health and creativity of school children.

Carter and Kuechenmeister (1986) conducted a program evaluation designed to determine the social/emotional impact of a gifted pullout program, grades 3-5 on its participants. Surveys were administered to 7 target groups; 301 gifted and 300 non gifted student, 221 parents of both groups, 11 teachers of the gifted, 38 regular classroom teachers and 10 principals. Data were analyzed to determine whether the program fostered elitism and interfered with the social interactions of the gifted and if higher expectations caused emotional problems in the gifted children. The analysis suggested that gifted children did not suffer any ill effects; however, classroom teachers and parents of the non-gifted tended to believe that the program promoted adverse effects.

Burns (1986) discussed the use of structured classroom musical creativity exercises as means of improving children's problem-solving abilities regarding divergent functioning, and complex thinking and feeling



The following activities nurture musical growth and development: improvising rhythmic and melodic ostinati, improvising melodic and rhythmic responses in "call and response" activities, creating movement patterns to fit musical forms, and composing melodies and creating songs. A process of composition that uses Hku poetry pentatonic scales, rhythmic durations, and melodic contours illustrates the sorts of activity recommended.

Landan (1986) discussed the enrichment programs of the Young Persons' Institute for the promotion of Art and Science in Tel-Aviv, Israel. The program uses a holistic approach to develop the latent of talent of the gifted child. In addition to regular schooling, gifted children attend special interest classes that further personality development.

Guskin, et al. (1986) surveyed 295 9-15year old students participating in summer programs for # the academically gifted and artistically talented to explore their conception of giftedness and talent, their recollection and interpretations of earlier to labelling experiences, and their perceptions of others' reactions to their being labelled gifted or talented. Findings suggest that these Ss have highly favourable view of themselves and of gifted and talented students in general. They believe that giftedness can be attained by hard work, and that gifted and talented students are not very different from others. Most perceived others as treating them either no differently than other or more favourably. Only a minority reported negative reactions from peers.



Starko (1986) described the process of curriculum compacting: a procedure for modifying the regular curriculum to meet the needs of above average students. Successful teaching techniques are presented that were developed by classroom teachers implementing curriculum compacting at a variety of grade levels. It is suggested that, in addition to the classroom teacher, the gifted education specialist and the building level administrator also play important roles, in successfully implementing compacting.

Howley (1986) reviewed current practices in gifted education within the context of the American political economy and examines ways in which gifted education legitimates the unequal distribution of wealth and power in the US. It is suggested that gifted education may be operationalized as advanced cognitive instruction, tangential enrichment, creativity training, career orientation, or leadership training. It is argued that the US society is not a meritocracy; rather its identification practices equate non-cognitive traits of middle-class complicity with superior potential. Thus it is held that the anti-intellectual climate of public schools provide non cognitive instruction to gifted students in order to thwart their development as intellectuals. Finally, the extent to which gifted programs are elitist are discussed.

Bransky (1987) studied the relationship of teachers' and administrators' specific knowledge about the gifted children's education program in their schools to their attitudes toward the program. The attitudes



of administrators, gifted program teachers, and regular program teachers were found to differ, with regular program teachers were found to differ, with regular program teachers' attitudes being the least favourable. The correlation between teacher knowledge and attitudes is discussed in light of the literature on teacher attitudes and organizational structures.

Sagi (1987) outlines a theory of creativity based on empirical research conducted in Hungary concerning the nature of creativity in music. All people, not just the most talented, have a basic generative creativity that should be nurtured for the purpose of evolving into more fulfilled, satisfied, human beings.

Johnson (1987) discussed various aspects of the thinking process, namely reasoning and imagining. Turing's thesis that any process, can be modeled by a finite set of instructions for an automation such as a computer is described. The concept that, on the other hand, human creativity may depend upon processes that cannot be given a scientific explanation is presented. It is contended that the best method to foster creativity is that of encouraging individuals to create early in their acquirement of the rudiments of a technique.



GIFTED - CREATIVITY - SEX DIFFERENCES:

Studies concerning the effect of sex on creativity have been quite contradictory. While the general conclusion is that boys score higher on creativity measures than girls, there have been a few studies showing differences favouring girls on creativity tests and a few studies reporting little sex differences with respect to creativity ability.

Some of the most firmly established facts now available about individual differences, concern the rarity of women among inventors (Rossman, 1931), Creative Scientists (Roe, 1951, 1953) creative studies (Greenacre, 1960) and creative genius (Shackleton-Bailey, 1972).

Torrance (1960) found that in experiments involving small groups working with science toys girls were quite reluctant and boys demonstrated and explained twice as many ideas as girls in experiments involving these materials. Later Torrance (1960) himself found that there was difference in the expression of enjoyment of the activity of boys and girls the mean performance of girls and boys was almost identical.

Valentine (1962) reported that introspective remarks of 146 subjects appeared to show that there were more men and women who were deeply sensitive to the impressions of musical intervals. Moreover, the proportion of judgements of high aesthetic judgement value made by 52 men was higher than among 84 women. This might be partly due to Valentine Rating 'Subjective'



judgements low. As far as interest in music is concerned, a such wider difference separates sexes on Gaston's (1958) interest inventory than is apparent in the norms for the tonal items of his test.

Torrance (1963) claims that sex differences in the manifestation of creativity appear not until five years of age, from then on boys begin to acquire superior ability in manipulation and experimentation; whereas girls excel only in fluency. Torrance affirms that apparently whatever factors explain the rarity of women among inventors and creative scientists, may begin operating as early as the 2nd or 3rd grade.

Wallach and Kogan (1965) report that for eight of ten measures of creativity utilised by them, the means for males and females are highly similar. It was the procedure administered first which yielded the significant sex differences (.01) in favour of boys. Conceivably, the girls, by virtue of their greater anxiety, did not adapt as quickly as boys to the experimental situation. High anxiety levels might readily contribute to an initially guarded attitude toward the whole experimental setting, with an inhibition of the associative creative process as the anticipated outcome. They claim that girls may simply require a slightly longer "warm up" period. In any event, the fact of no sex differences between the means on the subsequent 8 measures argue strongly for the conclusion that in general the performance level of boys and girls on the creativity instruments are very much alike.



Yamamoto and Chimbidis (1966) administered the Long Thorndike Intelligence Test, Minnesota Test of Creative Thinking and the Stanford Achievement Test to 790 5th grade subjects from North Eastern Ohio. Of many inter-correlations computed between subtests, few revealed sex differences. Similar to Wallach and Kogan's findings, Price and Bell (1966) in their administration of creativity tests consisting of consequences, Utility, Seeing Problem, 4 figure production, 5 Ideational Fluency Test, found that there was sex differences in few of the tasks but general sex difference was nil. Girls surpass boys in consequences obvious and Ideational Fluency Scores. These are verbal tasks on which one would assume that girls would excel. As was expected, boys performed better than girls on Figure Production. The scores on the other three tests showed no significant differences.

Heiso (1968) did an experiment wherein SVIB (Strong Vocational Interest Blank) was given to a group of men and women and an analysis of variance was performed on the data focussed on creativity x sex and creativity x sample interaction. The men were Mathematics and Architects and the women were Mathematicians and College Seniors. Seven of the 45 SVIB scales showed a significant creativity x sex interaction.

Arasten (1968) on the other hand, claims that the sex differences in creativity ability appear as early as the preschool age. If non-conformity is considered a component of creativity, then there is evidence from Stark



Weather and Cowlings' experiment that preschool girls tend to conform to adult behaviour, whereas boys of that age may be either conformists or non-conformists. Shunter (1968) reports that though differences in scores between the sexes are quantitatively quite small, there may be some qualitative differences underlying the differences in scores.

Straus and Straus (1968) on the basis of his experiment with American and Indian families, showed that girls' scores were lower than that of boys in both societies, while sex differences were greatest in India. The small sex differences in America is interpreted as reflecting the greater freedom and individuality permitted to American girls.

Jacqueline and Murray (1968) conducted a study of family roles and sex differences in creativity in Bombay and Minneapolis. Data for 128 Indian and American families showed that the Indian had lower scores than the Americans. Girls score was lower than the boys in both the societies while sex differences in creativity were greatest in India. It is unconcluded that individual creativity is likely to increase as societies move toward a less innovative normative code.

Bajard (1971) studied divergent thinking components (flexibility, fluency and originality) in 40 male and 40 female 11-12 year olds. The male groups showed more flexibility, fluency and originality than the female group. However, for both groups, the validity of divergent thinking tests was very low, if not negative.



Hussain, M.G. (1971) compared the creativity of 2 groups of children 10-14 year old; 100 girls in an urban high school, from families of middle or upper socioeconomic class, most of the parents being well-educated; and 100 boys in a rural high school from lower-middle class families, creativity scores for fluency, flexibility, and originality were administered. Girls scores significantly higher than boys on the "unusual uses test" on the other 3 tests the trend was in favour of the girls but was not statistically significant. Results contradict the common belief that boys are more creative than girls, but also fail to support the hypothesis that the girls would be more creative than boys. The higher creativity scores of the girls may be due to the fact that they came from a higher socio-economic class and thus were less restricted in expressing their ideas.

Sex differences have been found in other aspects of creativity too. Torrance (1972) reported on the basis of his 12 year follow-up study of 392 high school students identified as highly gifted on the basis of creativity tests, that the creative achievements of women are significantly less predictable than those of men. Evans and Fredriksen (1972) report that sex differences are present even in the mode of response. Females produced more obvious responses to the Consequences Tests, male more remote responses.

Aronon, Edward and Raychaudhuri and Manas (1972) comment on Raychaudhuri's Relation of Creativity and Sex to Research M responses. Aronon contends that contrary to statement made by M. Raychaudhuri the



studies of the relationship between Rorschach M and creativity have yielded contradictory evidence. Because intelligence and education were not adequately controlled, Raychaudhuri's findings cannot be regarded as further proof of a relationship between creativity and sex and Rorschach M. In a separate reply to Aronon, Raychaudhuri discusses previous findings and justifies his sampling procedures.

Ducette, Wolk and Friedman (1972) administered Intellectual Achievement Responsibility Questionnaire and Wallach and Kogan's Pattern Meaning Test to 202 black and 20 white lower-class male 9-11 years old. Internal Ss gave more creative responses and were more efficient than externals, regardless of race. Implications for locus of control theory are discussed.

In another study by Warren and Luria (1972) administration of a set of creativity tests with instructions meant to induce low, high and neutral evaluation sets, to 177 5th and 6th graders, revealed significantly better performance on part of the girls than boys on all measures of creativity.

There have also been a few studies reporting little or no sex differences on creativity scores (Dewing, 1970) or on aesthetic activities (Leonard and Lindaunder, 1973).

Haplin, Haplin and Torrance (1973) compared scores of verbal fluency, verbal flexibility and verbal originality on the Torrance Tests of Creative Thinking for 81 blind and 80 slighted 6-12 year olds. Scores, they found, did not vary by sex.



Hannaker and Shaffo (1975) gave productivity a greater weight in judging intelligence, over creativity and gender. In considering the three concepts share productivity one may infer the judges thought the males are more intelligent and creative than females.

Wallbrown, and Huelsman (1975) investigated the validity of Wallach and Kogan's (1965) creativity operations and measures for 73 third and fourth graders in an inner-city school. Two crayon drawings and clay products were obtained from each 5 and rated by four judges on originality and effectiveness of expression. Difficulties with the criterion process precluded an adequate test for the validity of the theory with regard to the drawings. For the clay models, however, the regression of both originality and expression ratings on creativity intelligence (WISC) and control variables strongly supported the operations. The line meanings and alternative Uses Subtests of the Wallach and Kogan measures accounted for 45 percent of the variance in the originality criterion and 52 percent of the variance in the effectiveness of expression criterion. A negative relationship was obtained between birth order and all 5 Wallach and Kogan subtests as well as both criterion dimensions. Wallach and Kogan's assert that their creativity operations define a pervasive dimension with discriminant validity from general intelligence was supported for the present Ss, who differed substantially on social, economic, and ethnic characteristics from Wallach and Kogan's standardization group.



Faterson (1980) and his colleagues have developed an original triarchic theory of intelligence and a sub-theory of insight. It is maintained that interactions among the elements of the triarchic theory explain giftedness. The question of whether giftedness is a subtest of intelligence vice versa remains controversial by a set of affective measures. A factor analysis was performed, the creativity and problem solving tasks, with two factors emerging. Fluency and Rearrangement factors were used to analyse sex and grade differences. Sex differences on the cognitive tasks were consistent with those reported in literature. No sex differences were obtained on the affective tasks. Fourth graders differed significantly from the sixth graders only on tolerance of ambiguity. Results are discussed in terms of importance of affective personality traits in the creative and problem solving process.

Karnes (1980) examined the sex differences in the WISC-R scores of 479 male and 467 female gifted students aged 6-16 years. Results show significant mean differences on several subtest scores and IQs generally favouring males.

Dharmangadan (1981) administered an adapted version of the Torrance Tests of Creative Thinking to 300 children (12.5 - 15.5 years of age). Results show that a) boy scored significantly higher than girls; b) both 14 and 15 year olds scored significantly higher than 13 year olds



- c) only on verbal tests did 15 year olds score higher than 14 year olds.
- d) in verbal tests, urban children scored higher than rural children; and
- e) few interactions were significant.

Evans and Marken (1982) assessed the cumulative impact of special class placement for 21 male and 22 female students in Grades 6-8 identified as gifted children in a public school. 12 male and 26 female age matched gifted Ss who proceeded with regular age grade placement over 3 years served as controls. Ss were administered a battery of psychological and behavioural measures to assess 5 goal domain areas. Measures included the Ross Test of High Cognitive Processes, the Quality of School Life Span Scale and the School and Cultural Activities Questionnaire. Data were analyzed by means of ANCOVA, with IQ as the covariate to determine any main effects of program, sex and grade on the 5 dependent measures together with any possible interaction effects. No main effects of special class placement were observed across any of the composite dependent variable measures. However, there were significant grade effects for higher order cognitive processing favouring 7th and 8th grade Ss regardless of class placement. Grade differences favouring older Ss were also observed in extra curricular participation. As a group, females reported stronger intellectual achievement responsibility and self perceived cognitively than did males. Males in special classes held somewhat less positive attitudes toward school and teachers, as well as weaker commitment to classwork. Overall, females (especially 7th grade controls) showed the most positive school orientation.



Shukla (1982) conducted a study of creativity in relation to sex, locality and school subjects. 100 high school students selected on the basis of sex, locality, and academic discipline were used to test the hypothesis that 1) creativity will differ in the male and female students 2) the rural-urban location of the schools is differentially related to students' creativity 3) there is a difference in the degree of creativity found in the science and art students. A verbal test of creative thinking that measured creativity in terms of fluency, flexibility, and originality were used for data collection. Analysis revealed that males in general were more creative than females. Ss in the urban schools were more creative than those in rural schools, and Ss in science were more creative than those in arts.

Rodgrignes and Soriano (1983) examined the creative thought of middle school students. 312 4th-6th grade Brazillian Students completed 2 verbal and 2 figurative subtests of the Torrance Tests of Creative Thinking, including Unusual Uses and Figure Completion, in an examination of the relations between creativity and grade level, sex and SES. Performance was higher among females, 5th and 6th grades, and Ss from middle SES backgrounds. A sex x SES interactions indicated a significant difference in favour of low-SES females, whereas among middle SES Ss a weaker sex difference was found in favour of males.



Hassler and Feil (1986) studied relationships among three modes of creative musical behaviour using 17 males and 13 females (aged 10-15 years) who were identified by scores on H. Wings (1968) Standardized Tests of Musical Intelligence. All Ss were able to play at least one instrument (males had an average of 5.14 years of training, and females had an average of 5.33 years). To demonstrate creative musical ability, Ss were asked to perform four tasks 1. present an original composition in written form 2. play the composition 3. perform an improvisation extempore, and 4. play a melody and improvise two phrases on it. Results indicate differences among composition, improvisation extempore, and improvisation on an existing framework. Difference were also found between male and female Ss.

The patiries written by 90 girls and 90 boys in Grades 1-6 were examined by Trepanier-Street and Romatowski (1986) for sex and age differences in the assignment of emotions and prosocial and aggressive behaviours to male (MSCs) and female (FSCs) story character. Finding show, in part, that girls tended to assign emotional states and prosocial behaviours to characters more often than did boys. Boys at all grades assigned emotions and prosocial behaviours MSCs more often than to FSCs. Younger girls assigned approximately equal number of emotions and prosocial behaviours to MSCs and FSCs. By the 5th/6th grade level, girls assigned more emotions and prosocial behaviours to FSCs than to MSCs. Boys assigned aggressive behaviours to characters more often than did girls.



Lewis and Houtz (1986) tested the hypothesis that girls are more knowledgeable of the opposite sex roles than are boys but are inhibited in the expression of this knowledge by cultural expectations, using 84 females and 67 male kindergarten and 1st graders. Ss were administered the Circles subtests of the Torrance Tests of Creative Thinking and given differential instructions to think of ideas typically thought of by members of the opposite sex. Results show that Ss given directions inconsistent with their sex had lower scores than when given consistent directions. When boys and girls experienced equal rules for expressing their ideas, they performed equally.

Singh, Bhoodev (1986) studied the role of socio-psychological factors on creativity among 165 urban and 112 rural Indian children (aged 11-13 years). All Ss were administered the following measures: Verbal and Nonverbal Creativity Tests by B. Mehdi (1973) a Hindi adaptation of the Thorndike Dimensions of Temperament Test by B. Singh and Mehdi (1982) and Biographical Inventory by Mehdi (1980). The Mahalanobis  $D^2$  test was used to analyze the data. The effect of biographic factors on creativity was found to be stronger than that of personality factors on creativity, and there was a significant interaction effect of biographic and personality factors on creativity.



Saijadi-Bafghi (1986) investigated the effects of time press (fixed Vs variable) on sex differences in production of verbal originality using 42 boys and 42 girls in grades 7-9. The main effects of time press and sex and their interaction effect were not significant.

Loeb and Jay (1987) compared 60 male and 65 female gifted and 46 male and 56 female non gifted 9-12 year old students on 3 pencil and paper measures of self-concept. The study used a multimethod approach including 3 self-report measures of various aspects of self-concept and both mother and teacher ratings. The samples did not differ significantly in family size, child's birth order, number of parents in the home, parent's marital status or maternal employment. Giftedness seemed to be an advantage for girls but not for boys. Mothers of gifted Ss described their child rearing approaches differently from mothers of non gifted Ss, suggesting that these styles may encourage academic success. The findings indicate the need for the determination of early education and for efforts toward positive evaluation of preteen boys for early academic success.

### III. GIFTED - CREATIVITY - EFFECT OF AGE:

Ducette, Wolk and Friedman (1972) administered Intellectual Achievement Responsibility Questionnaire and Wallach and Kogan's Pattern Meaning Test to 20 black and 20 white lower class male 9-11 year-olds.



Internal Ss gave more creative responses and were more efficient than externals, regardless of race. Implications for locus of control theory are discussed.

Ogletree, Earl and Ujlaki, Wilma (1973) administered the Torrance Tests of Creative Thinking of 479 English, 193 Scottish, and 493 German 8-12 year olds. Results show that creativity scores were a function of socio economic background. In all countries, Ss from upper class families obtained significantly higher creativity scores (verbal and non-verbal) than Ss from middle and lower class families. The same significant difference was evident in comparison of middle class to lower class Ss. This was true when analyzed within countries by age, grade, and sex. There was no evidence to support the contention that children from lower class backgrounds perform better on non-verbal tasks than their higher class peers, although they did make a better showing on the non verbal tasks than on the verbal.

Johnson (1974) studied differential effects of reward versus no reward instruction on the creative thinking of two economic levels of elementary school children. Examines: a) the effects of immediate and delayed reward instructions on performance on the Figural Form A of the Torrance Tests of Creative Thinking and b) the possible interactions between reward conditions and economic status and between reward conditions and grade level. Ss were 145 third, fourth and fifth graders. Ss who received immediate and delayed reward instructions scored approximately the



same and significantly higher than Ss who did not receive any reward instructions. There were no main effects for grade level or status. Only the Revised x Economic Status Interaction was significant. The performance of disadvantaged Ss was significantly higher under both reward conditions, while the performance of the relatively advantaged Ss was slightly higher in the no-reward condition.

Johnson, Roger, A. and Khatena, Joe (1975) studied oral and visual presentation and production of original responses. Obtained verbal originality scores from Onomatopocia and Images. Form 1 B, given to 106 10-12 year olds and 94 16-19 year olds. Older Ss scored significantly higher than younger Ss with significant main effects for age but not for method of word presentation. A significant interaction was found between word presentation method and age. Ss were more original with the oral presentation while younger Ss performed approximately the same with both methods.

Milgram and Norman (1977) examined the relationship between creative thinking (Wallach-Kogan Test of Creativity) and sex-role identity (sex, sex-role inventory) in 80 boys and 56 girls ages 9-12 years of above average intelligence (The Milta, a group intelligence test). Endorsement of personal characteristics that cut across sex stereotype was associated with participation in a wide variety of creative activities when analyzed by specific activity the relationship with sex role followed a consistent



pattern for boys and girls combined. Male activities such as sports with scores on the masculine scale, female activity with such as dance or art with scores on the feminine scale and sexually indeterminate activities such as drama or social leadership with scores on both scales.

Tennebaum, Houtz (1978) administered problem solving and creativity measure to 127 gifted New York City School Children from grades 4 to 6 in an attempt to relate these cognitive variables to the affective traits of locus of control, self esteem and tolerance of ambiguity. Affective measures were the Bialer-Cromwell Locus of Control Scale, Cooperamith Self-Esteem Inventory and Rydell-Rose AT20. A canonical correlation analysis indicated one significant canonical set in which 46 percent of the variability in a set of cognitive measures was explained by a set of effective measures. A factor analysis was performed on the creativity and problem solving tasks, with two factors emerging: Fluency and Rearrangement: Factor scores used to analyse sex and grade difference. Sex differences on the cognitive tasks were consistent with those reported in the literature. No sex differences were obtained on the affective tasks. Fourth graders differed significantly from the 6th graders on the rearrangement factor only. On the affective tasks, 4th graders differed from both 5th and 6th graders only on tolerance of ambiguity. Results are discussed in terms of the importance of affective personality traits in the creative and problem solving process.



Houtz, Rosenfield and Tetenabum (1978) administered a variety of creative thinking and problem solving tasks to 233 intellectually gifted 2nd-6th graders at a special school for the gifted in New York City. The tasks were selected to represent conceptual stages of a total creative problem solving model. Intelligence, achievement, and personality data were also gathered. Findings indicate interesting patterns of growth in creative problem solving abilities. On the creative thinking tasks a plateau in performance appeared from grade 4 on, but on the problem solving tasks, growth continued through grade 6. Individual variation within the sets of creative thinking and problem solving tasks was great suggesting the need to train the gifted in the skills of creativity and problem solving.

Kerlin and Johnson (1979) examined whether being classified as having normal, moderate, or severe problems affected the creativity scores of 90 low income boys aged 8-12 years, who were not mentally retarded. The Figural Form B of the Torrance Test of Creative Thinking (TTCT) was used. Normal Ss scored significantly higher than problem behaviour boys on the Creativity Index and on the originality, Titles and Resistance to Quick Closure Subtests of the TTCT. There was also a main effect for age, the oldest Ss scoring significantly higher on the Elaboration Subtest. The only significant interaction was Problem Condition by Age. Normal Ss and those with moderate behaviour problems scored higher on the titles subtest as their ages increased.



Westerlund (1980) studied scientific interest concerning creativity has thus far been concentrated on children and teenagers. Though only a few studies with adults and elderly individuals have been done, a decrement with age has been found. The decrement is partially explained by a slowing in the cognitive process as well processes as well as by increasing rigidity with age. Factors in the testing situation add to this decrement-the cognitive set created by the test instructions, test atmosphere and time limits. It has been found that older Ss are more creative in situations that lack time limits and that are characterized by a game like atmosphere and do not require changes in a cognitive set.

Milgram and Rabkin (1980) compared the associative response hierarchies of 90 4th, 7th and 12th graders on the Wallach and Kogan Creativity Battery. The findings support S.A. Mednick's (1962) associative model with common responses occurring earlier and unusual responses, especially those of high quality, later in the response sequence. The order effect was related to age, appearing only between ages 12 and 17, except in high scoring Ss in whom it appeared earlier, between ages 9 and 12. There was a clear age tend of increased production of unusual ideas, especially unusual ideas of high quality, at the expense of more common ones.

Karnes, Frances and Wherry Jeffrey (1981) studied self-concept of gifted children using the Piers-Harris Children's Self Concept Scale. 153 gifted students from grades 4-7 completed the scale. No significant



differences were found among grades, between sexes, or between students enrolled in such programs. A significant difference was found between the gifted Ss and the standardization population, suggesting higher self-esteem for the gifted.

Wechsler, Solange and Richmond, Bart (1982) examined creative strengths of Brazilian and US children. The Thinking Creatively with pictures Subscales of the Torrance Tests of Creative Thinking was used to compare the creative thinking of 265 Brazilian 1st, 2nd 3rd and 4th graders to 50002 US children in the same age categories. Brazilian Ss at all grade levels scored higher in Expression of Feelings. Unusual Visual Perspective and in the Extension of Boundaries. US Ss were generally higher in Humour and Colorfulness of Imagery.

Casiorowska, Jolanta (1982) tested, 1,100 children (aged 3-15years) from 3 cultural environments with the Draw-A-Man Test in order to determine Ss' mental level and their level of creative drawing. Analysis of the drawings showed that these Ss were accelerated for their ages when compared to the accepted norms for this test. The author suggests that the norms for Draw-A-Man be revised, since the technique seems to lose its diagnostic value for Ss over 9 years of age.

Lenser and Hillman (1983) proposed a way of looking at creativity from a perspective that merges psychiatry, psychology and human development, and attempts to promote a better understanding of the relationship between



thinking, feeling and creating. Creativity is seen as a developmental phenomenon and a rudimentary theory of its development in the individual is provided. The theory is derived from concepts found in 3 major developmental theories: Freud's theory of psycho-sexual development, Erikson's (1963) theory of psychosocial development, and Piaget's (1962) theory of cognitive development. A developmental scheme is constructed, that is, consistent with these 3 theories that presents a logical sequence of stages representing the life cycle of creativity. The stages consist of creative internal enrichment, creative external enrichment and creative self-evaluation. Recommendation as to how creativity can be facilitated at any stage of development are made, and it is concluded that creativity is not a characteristic of a chosen few, but a process that is within everyone that is essential to adaptation to life's demands.

Harrington, Block and Block (1983) administered to 75 children (ages 4 and 5 years) 2 divergent thinking (DI) measures (Instances and Unusual Uses) and 2 conventional tests of general intelligence. Six and seven years later, these Ss then preadolescents were evaluated with respect to creativity by their 6th-grade teachers. These creativity evaluation at 11 years exhibited substantial discriminant and construct validity and were relatively free of halo effects. A composite score based on the number of high quality, divergent thinking responses in childhood (i.e. responses



reflecting both imagination and sensitivity to task constraints) correlated significantly with teacher evaluation of preadolescent creativity. This construct validating correlation which spanned 6 and 7 years and 2 measurement domains was 0.45 uncorrected for attention. Even more important this composite DT high quality score in early childhood incrementally accounted for 14 percent of the variance in preadolescent creativity evaluation beyond that accounted for by sex and conventionally measured intelligence and DT fluency (number of responses regardless of quality).

Borzym Irena (1983) examined learning and plasticity and the connection between these aspects of intellectual functioning and academic progress among 9-22 year old students with IQs above 125. Results show that these gifted Ss learned more rapidly and displayed more plasticity than non-gifted students, with difference being statistically significant in 12-13 year olds and in adults. Originality was also great in gifted Ss than in non-gifted Ss, with the difference being particularly marked in 19-22 year olds.

Smith, Guadmund and Carlson, Ingegerd (1985) investigated the development of creativity (the inclination to transgress the confines of an established perceptual context) in 142 youngsters (aged 12-16 years). At least parents of more than half of the Ss was a college student (academic background). Ss were tested with a percept-genetic creativity test, a



creativity-fantasy scale, and a percept-genetic personality test. Results indicate that often a creative peak among 10-11 year olds, 12 year-olds shared a significant decrease of strong creativity signs, a simultaneous increase of compulsive and kindered defense strategies, and a decrease of signs of anxiety. The recovery of creativity was slow during high puberty (14-15 years), but more marked after 16 years. Using the duality of inwardness and the outside world as a point of departure, the present authors discuss the fluctuations between high and low creative periods and explain why they were more pronounced among Ss with an academic home background.

Bekey and Michael (1986-87) examined 60 girls in grades 4-6 who were differentiated as belonging to a regularly gifted (RG) subgroup (IQs of 132-144) or a highly gifted (HG) sub group (IQs of 145-185) completed 2 concrete operations tasks and 3 formal operations exercises. The mean time of 29.86 minutes required by the HG subsample was significantly less than the that of 35.93 minutes for RG subsample to complete all 5 Piagetian tasks. It is concluded that the time variable is a more valid predictor of success on Piagetian tasks than is either chronological age or scores on a standardized intelligence test and that many gifted girls as young as 9-10 years can perform successfully on at least 1 kind of formal operations task



GIFTED - CREATIVITY - EFFECT OF ORDINAL POSITION:

In recent years, order of birth and its effect on child development have attracted wide spread scientific attention. A number of studies have reported birth order differences in giftedness and creativity.

Roe (1953) notes a greater than chance incidence of first born children among her sample of 64 scientists, which accords with a similar finding by Cattell and Brimhall (1921) on a sample of 855 and Repucci (1962). Studies done by Terman, et al. (1925), Wersberg and Springer (1961), Schacter (1959, 1963), Goertzel (1962), Atlus (1965) also report the better creative performance of the first borns in comparison to the later borns. Helson (1969) in the study of female graduates found all the creative subjects to be first and second borns. Lunnerberg (1968) concluded that among 5,401 high school seniors, first borns were superior verbally as well as quantitatively.

Lichtenwalner and Maxwell (1969) in their sample of 68 middle and lower class pre schoolers found no significant differences between oldest or only children but regardless of sex, the mean scores of the oldest and only children were approximately 3 points higher than the mean scores of the later born children.

Although there has been an increasing amount of research on birth order (Sampson and Hancock, 1967) (Eisenman and Platt, 1968); Taylor and Eisenman, 1968); (Eisenman, 1967) suggests that sex of subject should also



be considered along with ordinal position of the subjects. Employing the programs used for measuring complexity - simplicity, Eiseman (1967) found birth order and sex differences. First born males and later born females preferred more complexity than other males and females respectively. In addition, Eiseman found that females preferred more complexity than males, the relationship being stronger for sex differences than for ordinal position. Since preferences for complexity seems to be related to creativity (Barron, 1963), (Taylor and Eisenman, 1964) it follows that first born males are more creative than later born males (Eisenman and Schussel, 1970), (Taylor and Eisenman, 1968), (Eisenman and Cherry, 1970), (Helson, 1969) (Rosenberg and Sutton Smith, 1968), (Loof and Baranowaki, 1971) and 1st born females are less creative than later born females (Eisenman, 1967). Explanation accorded by Eisenman for the difference in creative performance is that the first born male is often the prized member of the family in that he may be seen as the "little being" who will some day follow in his father's footsteps. As a result of greater independence accorded to males, the first born's interactions with his parents may result in a rather adult-like style even at an early age which may continue even into adulthood and more likely result in an attitude of serious approach to life and to place a heavier emphasis on verbal and intellectual problems than are later born males or females in general. Such a style would be consistent with the correlates found in those who prefer complex stimuli independent a flexible approach,



and perhaps as a result of these personality characteristics a greater likelihood of creative discomplishment (Barron, 1963).

Schacter (1963) found that the birth order effects showed up increasingly between early and later college and graduate school and he concluded that eminent individuals come from middle class families which tend to send their only or first born children to college more often than younger siblings. Guilford (1967) suggests that the eldest child being given responsibility for looking after the younger ones in the family and perhaps other responsibilities, would consequently develop more readily the habits of self initiated thinking and independence of thinking.

Singer (1961) does not speak of the first born children in his study but rather contends that children who were rated higher on fantasy measures tended to be only children and further they tended to have more younger siblings and few older siblings, but this relationship did not reach statistical significance because of the small number of only children in his sample.

Contradicting the contention of the above given studies, Datta (1967) on the basis of his study of 536 young scientists showed that being first born was not related to unusual attainment, although his criterion of attainment was sensitive to other differences among the groups. Similar results were found in his later study of 573 male adolescents (Datta, 1968). The study does not suggest that there may be an inhibiting influence on the younger



son who is more isolated, yet for a considerable range of family size, sibling sex, sibling separation and ordinal position combinations any 'favourable effect' of one ordinal position appears to be as susceptible to attenuation by other influences as any 'unfavourable effects' of another ordinal position. The general trend of his results tends to support Schacter's (1963) suggestion that birth order effect as shown by predominance of first borns among eminent men is an artefact of lack of appropriate control groups. In fact using the Word Association Test and the User Test on 50 1st born and 50 later born undergraduates, Staffieri (1970) found that later borns scored higher on measures of creativity than did the first borns.

That middle, later born and only children are likely to be more creative than the first borns is supported by the studies of Eisenman (1969) and Harrison (1969). Typically, the first born is subjected to greater pressures to conform to parental expectations than those born later pressures that encourage the child to be a conformer rather than a creator. As only child is spared many of the parental pressure common in homes where there are siblings and is also given opportunities to develop individuality he emerges as more creative (Datta, 1968); (Eisenman, 1969); (Harrison, 1969; Staffieri, 1970).

Additional possibility which the literature presents is that creativity achievement may be area specific. Atlus (1968) find that the first borns are considerably more likely to choose engineering, mathematics



or physics as a college major, while later borns choose art and music more than do first born. Furthermore, after graduation and regardless of college major, first born peace corps volunteers were found by Exner and Sutton Smith (1970) to be more effective in Maths-Science Programmes and second or third borns in English teaching programmes. Consistent with this is Bliss's (1970) finding that 64 writers and poets were more often later borns. Adams (1972) says that how the theories of birth order effects might explain the link between being first born and quantitative-scientific preference and excellence or being later born and verbal excellence is far from obvious.

Almost all studies conducted so far on creative ability have indicated birth order effects. However, Circirell (1967), in a study relating sibling constellation factors to measures of creativity (Minnesota Tests of Creative Thinking) in a 6th grade population found little evidence for birth order relation to creative ability in 144, three and four child families. Raychaudhuri (1965) too found little association of the subjects' position in the birth order to his creative performance. Datta (1967, 1968) too found no birth order effects in his sample of male adolescents.

Wallbrown, and Huelsman (1975) investigated the validity of Wallach and Kogan's (1965) creativity operations and measures for 73 third and fourth graders in an inner-city school. Two crayon drawings and clay products were obtained from each 5 and rated by four judges on originality and effectiveness



of expression. Difficulties with the criterion process precluded an adequate test for the validity of the theory with regard to the drawings. For the clay models, however, the regression of both originality and expression ratings on creativity intelligence (WISC) and control variables strongly supported the operations. The line meanings and alternative Uses Subtests of the Wallach and Kogan measures accounted for 45 percent of the variance in the originality criterion and 52 percent of the variance in the effectiveness of expression criterion. A negative relationship was obtained between birth order and all 5 Wallach and Kogan subtests as well as both criterion dimensions. Wallach and Kogan's assert that their creativity operations define a pervasive dimension with discriminant validity from general intelligence was supported for the present Es, who differed substantially on social, economic, and ethnic characteristics from Wallach and Kogan's standardization group.

Kaltounis, Bill (1978) conducted creative performance among siblings of various ordinal birth positions. The Torrance Tests of Thinking Creativity with Picture and Words, Forms A were administered to 9 sets of 4 brothers in grades 3, 4 and 5 and 6 who were little over a year apart from each other. Analysis showed that the second born performed significantly better on both tests.

Pulvini and Lupton (1978) tested R.B. Zajonc's (1975, 1976) confluence model of the development of intellectual potential. This model assigns quantitative values to birth order, and family size and states that first borns



and children from small families have higher values and thus develop a higher intellectual potential. Ss in the study were 380 gifted and superior high school students who were administered the Terman Concept Mastery Test. Results agree with the Zajonc Model. Ss from small families performed significantly better on the Terman Test than those from large and medium size families. First borns from medium and large families, but not from small families, performed better than those born later.

Wilks and Thompson (1979) examined the relationship between birth order and assessed creative ability was giving specific attention to characteristic of the measures used. As were 68 1st-4th graders from 22 elementary schools. Assessment of creativity was obtained from the Torrance Test of Creative Thinking Penguin Picture Story Task, and Singer Fantasy Questionnaire. No ordinal differences were found on the creativity measures for these Ss.

Forman (1979) administered the Wallach Kogan Tests of Creativity, the Primal Mental Abilities Tests, and subtests from the Iowa Tests of Basic Skills to 129 2nd graders. Results of a multivariate ANOVA indicated that upper class Ss scored better than lower class Ss on creativity measures, but that when IQ or achievement level was covaried, differences between upper and lower class Ss were not significant.

Comeau (1980) compared scores on the Torrance Tests of Creative Thinking of 32 sets of 1st and 2nd born siblings. The older siblings had



significantly higher scores on the fluency, originality and elaboration subtests, but not on the flexibility subtest. The sex of the older or younger siblings was not significant.

Runco, Mark and Bahleda, Michael (1987) evaluated the relationship of birth order and creativity using 234 gifted and nongifted children (5th-8th graders), 5 divergent thinking tests and multivariate procedures to test birth order and its interaction with number of siblings, gender, and age. Results indicate that only children had the highest divergent thinking test scores, followed by eldest, youngest, and their middle children.

From a review of the studies, given above, regarding birth order creative ability, it is apparent that they are contradictory with little chance of arriving at a conclusive decision.

#### GIFTEDNESS AND CREATIVITY - THEIR RELATIONSHIP:

Cropply and Maslany (1969) administered the Wallach-Kogan Tests of Creativity and Primary Mental abilities test to 207 undergraduates. The creativity tests were scored for originality, and KR 20 reliabilities calculated and compared with those among the six intelligence tests. Results indicated that the Wallach-Kogan Tests were highly reliable, clustered strongly among themselves and correlated poorly with the intelligence tests. A factor analysis indicated the existence of large loadings of creativity tests on the intelligence factor, and of intelligence tests on the creativity factor.



Geng and Mehl (1969) studies of Mathematics were found to be superior in general intellectual as well as in productive and creative capacities to both special students of music normal non specialized students. Music students showed a middle position on performance ability, but were similar to non specialised students on performance tendencies. A profile analysis of the Intelligence Struktur Test found the mathematics students to show certain pronounced special abilities. It was also found that when compared to non specialised students music students did not show these special abilities. It was also found that students mathematics showed a greater crystallization of "s" factors with increasing developmental age.

Mattalia (1970) presents a quantitative and qualitative analysis of intellectual processes through the CM 38 and other psychiatric techniques in a group of students in a secondary school of turin, Italy. It showed that the process of logical intelligence and those of creative potential evolve according to relatively independent lines. The operative divergence between logical and creative process seem to be bound more in the originality of the mental elaboration rather than the Ss' productiveness.

Pfeiffer (1971) a review of the literature reveals that the present definition of the gifted in terms of intelligence is too broad. It is suggested that the term gifted should be viewed in terms of the learning process, e.g. potential and maturation, depending on socio economic strata, linguistic culture, and cognitive information processing.



Richmond (1971) studied creative and cognitive abilities of white and negro children. Thirty-four negro and 36 Caucasian children in 8th grade segregated classes in Georgia were administered and Lorge - Thorndike Intelligence Tests (Level 4) and the Torrance Test of Creative Thinking, Verbal and Figural, form B on 2 successive days by the same examiner. Analysis of variance were conducted, and results found Caucasian students significantly higher (.05 level) on verbal and non verbal intelligence, verbal fluency, verbal flexibility, figural flexibility and figural originality. No negro caucasian differences were found on verbal elaboration. Females scored higher than males only on figural elaboration.

Cropley (1972) administered the Seeing Problems, Consequences, Symbol Production, Hidden Figures and E. Torrance's Tin Can uses and circle Tests to seventh graders in June 1964. In April 1969, 111 Ss were relocated. Data concerning their out of school achievements, in drama, art, literature, and music were collected. When the six creativity tests were combined to form a single composite creativity predictor and correlated with the four achievement tasks, combined to form a single criterion of creative behaviour in non-academic life; thus resulting canonical correlations were .52 for boys .46 for girls and .51 for the full sample. Results, indicate that creativity tests can be said to possess reasonable and encouraging long range predictive validity.



divergent thinking. The many research studies that sought to measure the relationship between creativity and intelligence have generally found the correlations to be positive but low. Many factors generally not held constant in the research studies, have been identified as the Ss' sex, age, family milieu, social conditions personality traits, method and techniques of instruction and out of school experiences. Also several conditions have interfered with a definite conclusion about the relationship between intelligence and creativity, eg. lack of agreement about the definitions job intelligence and creativity, the reliability and validity of the testing procedures, the diversity of the operations of intelligence and creativity, and the social reinforcement to the manifestations of intelligence and creativity.

Shibuya, Kimura and Mitsmmoto (1973) constructed and tested a creative ability scale using at item one factor scoring method and administered to 974 first year Junior High School pupils in 5 schools. Correlations between creativity, intelligence and achievement were examined and showed the intelligence-achievement correlation to be highest, followed by the creativity-achievement and creativity-intelligence correlations. The degree of relationship varied among the different schools. It is suggested that creative ability be regarding as an intellectual component; this would lead a revision of the traditional concept of under and over achievers.



Skin and Jawbs (1973) investigated the interrelationships among the Otis-Quick Scoring Mental Ability Tests, 6 measures of verbal creative behaviour reflecting the product dimension of J. Guilford's structure of intellect model, and 6 measures of achievement based on B. Bloom's taxonomy for the cognitive domain. Intelligence was associated with the 4 most basic levels of achievement while creativity was associated with the two higher levels. Further analysis indicates the independence of these two types of achievement and that two independent level of creative behaviour which are independent of intelligence were tapped by the six creativity measure used.

Ogilvie (1974) studied creativity and curriculum structure. Ten and 11 year old children in 5 schools with environments varying greatly in structured formality were tested for their ability to handle complexity, associative fluency, and originality in game-like situations free from time and examination stresses. Results show a curvilinear relationship between creativity of students and informality level of the classroom, suggesting that school environments influence creativity, but the assumption that progressive environments are more favourable must be qualified. Curriculum structure does not affect creativity intelligence of the groups and extent to which creativity tests require school learning, especially verbal skills. Results support the three hold theory of the inter-relationship between intelligence and creativity.



Csendorue, Schuller and Gabriella (1978) compared data from the completion and unconventional use of the Torrance Tests of Creative Thinking with the verbal quotient (VQ) scores on the The Hungarian Version of the WISC. Twenty-six healthy 5-6 year olds were Ss. There was no correlation between the verbal creativity index and the VQ. The most verbally creative Ss were also verbally, intelligent, but only half of the verbally intelligent Ss were also verbally creative. Results agree with previous comparisons of total IQ and total creativity in school age Ss. Results support the idea that creativity should be considered as part of intelligence.

Kovacova (1979) report an investigation of the relationship between creativity and cognitive processes. Using the Torrance Tests of Creative Thinking, high and low creative groups were compared on measures of intelligence, mental depiction processes, imagination, and pictogram interpretation. No marked relationship was found between creativity and intelligence, but there were some differences between the groups in imagination and mutual depiction.

Mabi (1979) discussed creativity in relation to personality, self-confidence, and intelligence. It is concluded that the creative person possesses personality characteristics such as autonomy, independence, some traits of femininity, self-assertion, self-acceptance, resourcefulness, and complexity. The creative person generally expresses a pleasant attitude toward life and daily activities. This person is also highly motivated and seeks new achievement.



Jarial and Sharma (1980) investigated the effects of intelligence and personality and their interaction on the fluency, flexibility, originality and total creativity of 200 high school students. Ss completed measures assessing their creativity and mental ability, and also the Maudsley Personality Inventory. Results show a significant effect of intelligence on the factors studied. Introverts and ext<sup>o</sup>verts differed on originality. The interaction effect on intelligence and personality on creativity and its components was significant.

Doutriaux (1980) examined parental occupation to classify 133 10-11 year olds Parisian Public School children to study creativity, intelligence (IQ) and school success in relation to sociocultural environment. Creativity was measured by a French adaptation of the Torrance Tests of Creative Thinking (Form A), IQ by the Cattell Culture Fair Intelligence Test 2, and school achievement by a 5-category ranking in French (Grammar and Expression) and mathematics IQ and school success, but not creativity, were found to be correlated with parental occupation. The obtained covariation might be explained in terms of convergent thinking.

To develop a test of creativity that is interesting and easily administered, does not draw on other abilities, and may be statistically analyzed, the puzzle known as tangrams was employed by Domino (1980). A tangram is made up of 7 pieces each of which is a simple shape. In



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this application the task of the S is to assemble the pieces to create original pictures. The designs created by a sample of 32 children in a 3rd grade class for the gifted were shown to be significantly higher on Fluency, Flexibility and Originality than those produced by a comparable sample of children enrolled in a standard class. Performance of 57 undergraduates on the tangrams, scored on the same 3 variables, was shown to correlate significantly with 4 of 5 tests of creativity. A correlation of 0.62 was found between human movement responses on the Holtzman Inkblot Test and on the tangrams, for a sample of 26 students enrolled in an advanced design course. For each of the S groups, correlations were computed between indices of academic achievement and performance on the tangrams. Of a total of 72 such correlations, only 2 were significant. It is concluded that the initial validity data presented are encouraging.

Reisman and Torrance (1980) correlated 133 kindergartners and 1st graders scores on the Metropolitan Readiness Test with their creativity indicators on the Torrance Tests of Creative Thinking, Figural Form B, and performances on selected conservation tasks. Significant correlations were found among the three sets of measures. The creative indicators appeared to be sensitive to identifying strengths not suggested by other measures.

Strauss, Hadar, Shavit and Itsckowitz (1981) examined the extent to which creativity could be identified in 71 1st groups (IQs above 100) and raised the question of whether and how creativity is related to anxiety



and regression at this age. Furthermore, intelligence was studied in relation to anxiety and repression. Creativity was measured with the Torrance Tests of Creative Thinking, and repression and anxiety were assessed by the Rorschach. A significant correlation of 0.62 was obtained between creativity and decrease in repression. The various subtests and the 4 dimension of creativity were separately analyzed in relation to anxiety and repression. No relation was found between intelligence and anxiety and repression.

Sternberg (1982) argues that intelligence seems to consist in large part of the ability to deal with non entrenched tasks and concepts, but this ability seems only to be peripherally measured by current test of intelligence. This view brings the concept of intelligence closer to that of creativity, as usually conceived, but still maintains the distinction between convergent and divergent between what is measured in intelligence tests and what is measured in creativity tests. Examples of non-entrenchment in the assessment of intellectual giftedness are provided.

Houtz and Denmark (1983) conducted a study on student perceptions of cognitive classroom structure and development of creative thinking and problem solving skills. A classroom activities questionnaire (CAQ), the Torrance Tests of Creative Thinking Verbal Forms, and several verbal maze problem solving tasks were administered to 207 students in grades 4-6 from 14 suburban, middle class classrooms. While problem solving performance related only to intelligence and match achievement scores,



ideational fluency related significantly to Ss perceptions of emphasis on higher level thinking skills in the classroom and positive classroom climate. These relationships were unchanged after partialing out the effects of IQ and school achievement. Ss perceptions of teacher focus (ie. control) were negatively related to other factors of the CAQ. Increasing grade level also showed some decline in fluency and in the perception of emphasis on height level thinking skills together with less positive classroom climate.

Reddy and Reddy (1983) administered the Raven Standard Progressive Matrices (SPM) and a battery of creativity tests, such as lists of unusual uses and similarities, to 90 high school students. With the exception of an "impossibilities test", creativity scores were significantly correlated with flexibility, fluency, originality, and the composite mental abilities score. However, a moderate negative correlation was found between creativity and mental abilities in 22 Ss with high scores on the SPM. It is suggested that an overemphasis on convergent thinking (intelligence) may hamper the development of divergent thinking (creativity). Results are discussed in relation to previous findings indicating that the positive relationship between intelligence and creativity changes at some critical point.

Runco and Albert (1986) investigated intrafamilial correlation of divergent thinking, using 54 12-13 year old males (with IQs over 150 or outstanding math/science SAT scores) and their parents. Divergent thinking tests were administered to the Ss and their parents as one component of a



large set of interview/self report/ability measures. Canonical and bivariate analyses indicated that there was a strong correlation between Ss' divergent thinking test scores and parent's divergent thinking test scores. High IQ Ss' divergent thinking test scores related to those of both parents, and the math/science Ss' divergent thinking test scores related only to those of their mothers. It is concluded that the relationship between parents' and their children's divergent thinking is a function of level of ability.

Clark (1986) discusses recent discoveries about the organization and functioning of the brain and their implications for education of highly intelligent and gifted children. Research on the impact of the environment on the brain and on intelligence is reviewed. It appears that neither intelligence nor giftedness can be viewed as solely the result of cognitive functions. The development of both relies on the use and integration of the functions of the total brain, including thinking, feeling, physical sensation and intuition.

Runco and Albert (1986) administered 5 divergent thinking tests to a heterogeneous sample of 228 school children to assess the threshold theory of creativity. Ss included 46 5th graders, 57 6th graders, 57 7th graders, and 68 8th graders. The theory posits that creativity and intelligence are related only up to an IQ of 120. The tests were from the battery developed by M.A. Wallach and N. Kogan (1965). Correlations between



measures of creativity and intelligence were calculated within 4 IQ levels and within California Achievement Test quartiles. Results indicate that the relationship between creativity and intelligence is a function of the particular measures employed and heterogeneity of the Ss sampled.

EVALUATION:

A review of the related studies indicated that the impact of various enrichment programmes to foster creativity among gifted have been widely explored in the West. However, only a begining has been made in Indian research in this area. There is wide scope for Indian researches to explore this area. The studies cited so far have made partial attempts to investigate the interactions between age, sex and ordinal position with reference to giftedness and creativity among elementary school children. This is an area which needs further research.



DESIGN, METHOD AND PROCEDURE

The experimental procedure is discussed under the following headings:

1. Aim
2. Research Design
3. Operational Definitions
4. Hypotheses
5. Sampling Method
6. Development of the Enrichment Programme for  
fostering Creativity
7. Descriptions and Administration of the  
Enrichment Activities
8. Selection of Tools
9. Administration of the Tools
10. Enrichment Activities
11. Data Collection

1. AIM: The aims of the present study are:

- i) Identifying the intellectually gifted children in some selected schools using both subjective and objective methods of evaluation and also assessing their creative abilities
- ii) To foster creativity in these gifted children through selective enrichment activities
- iii) To determine whether the enrichment activities have any impact on the creativity of the gifted children, and
- iv) To study the effect of age, sex and ordinal positions on the improvement scores of creativity of the gifted children, due to enrichment activities.



2. Research Design:

The design selected for this study is the "Before and After Control Group" (Pre-test and Post-test), when pretests and post tests are used, matching is of course present (Kerlinger, 1973).

$Y_{b1}$	$X$	$Y_{a1}$	(Experimental)
$Y_{b2}$	$Y$	$Y_{a2}$	(Control)

The experimental manipulation of enrichment programme for one group of (Experimental Group) after which both groups (Experimental and Control Groups) are again measured on the dependent variable, that is, creativity of the experimental group. The difference between the two groups will be tested as well as the difference between the pretest and post-test scores of the two groups.

3. Operational Definitions; Definition of Terms:

- i) Gifted Children: are operationally defined as those children whose intellectual ability enables them to score at or above 135 Intelligence Quotient on a Wechsler Intelligence Scale for Children, which is an individual intelligence test (Wechsler, 1958). Students accepted in the present project have the following characteristics: scores of 135 or more on IQ tests, and are performing at least two years or above grade level on reading and mathematic achievement tests.
- ii) Creativity: is operationally defined in terms of uniqueness and productivity that is, the child's ability to generate unique and plentiful associations in a generally task-appropriate manner and in a relatively playful context (Wallach and Kogan, 1965).



iii) Supplementary Programs: These are programs that take place after school on Saturday or during the summer months. The classes can meet in any setting from a school campus to youth club or University.

iv) Enrichment: Defined by Gallagher (1978) "The type of activity devoted to the further development of the particular intellectual skills and talents of the gifted child

These might be described as:

1. The ability to associate and inter-relate concepts
2. The ability to evaluate facts and arguments critically
3. The ability to create new ideas and originate new lines of thought
4. The ability to reason through complex problems
5. The ability to understand other situations, other times and other people, to be less bound by one's own peculiar environmental surroundings.

Enrichment is a term used narrowly to define a particular set of supplementary educational activities or broadly to explain the general purpose of education (Castglione, 1984). Enrichment Programme takes the form of extra assignments for the gifted, special projects, hobby clubs, more advanced and in-depth study of regular curricular subjects. The aims of enrichment are to:

- i) increase the depth of knowledge (Intensive Enrichment)
- ii) increase the breadth of knowledge (Extensive Enrichment)
- iii) develop fundamental and other skills

Creativity: Creativity may be defined as the ability to bring something new into existence (Guilford, 1965).



Elements of Creativity:

Guilford (1965) defines Associative Fluency as the ability to think of words rapidly that meet certain requirements such as being synonymous or being opposite.

Flexibility is the ability to strike out in a number of different directions in one's thinking (Guilford, 1965).

Originality is a quality which can be demonstrated in several ways one being uncommonness of ideas a person has, another the ability to produce clever "original" titles for stories and another being the ability to see unusual consequences of outlandish hypotheses, such as, "what would happen if people only had three fingers?"

Both Guilford (1962) and Terman (1963) considered the factors such as convergent thinking (the giving out of factual information, as measured by IQ tests) and divergent thinking (in which fluency, flexibility and originality are considered) as the primary components of divergent thinking.

v. Age: According to Webster's Dictionary (1974) age has been defined as the length of time a living organism has existed

vi. Sex: Sex has been operationally defined as the distinction between male and female (Chamber's Dictionary, 1979)

vii. Ordinal Position: The ordinal position refers to the order of birth of an individual such as the oldest, middle, youngest and only child (Hurlock, 1972)



viii. Elementary School Age: is operationally defined as the age from six to 12 years in the individual's life which is marked by rapid growth in all aspects of development (Hurlock, 1972).

Hypotheses:

The following hypotheses were formulated and examined in the present study:

I. Enrichment program will have a definite bearing in fostering creativity among the

- a) gifted boys b) gifted girls c) gifted boys and girls

II. Gain in creativity scores due to enrichment program will not be influenced by the ordinal position among

- a) gifted boys and b) gifted girls

III. a) Sex will not have any bearing on the improvement level of creativity of gifted elementary school children belonging to different ordinal positions

b) Sex will not have any influence on the improvement levels of creativity of gifted elementary school children belonging to different age groups

IV. a) There will be great differences in the creativity gain scores of the gifted boys (due to exposure to enrichment programme) of the age groups

i) 7-8 year-olds

ii) 9-10 year-olds

iii) 11-12 year-olds



b) There will be marked differences in the creativity gain scores of the gifted girls (due to exposure to enrichment programme) of the age groups

- i) 7-8 year-olds
- ii) 9-10 year-olds
- iii) 11-12 year-olds

c) There will be marked differences between 7-8 and 9-12 year-old gifted children in their mean creativity gain scores due to their exposure to enrichment programme

v. 1) Intelligence Quotient and Creativity gain scores will be related among

- a) gifted boys b) gifted girls c) gifted children

2) Age will not have any effect on the IQ scores of elementary gifted

- a) boys and b) girls

3) Ordinal Position will not have any bearing on the IQ score of the gifted

- a) boys b) girls

5. Sampling Method:

This consisted of 2 main aspects:

1. Selecting the schools

2. Selecting the sample size

1. Selecting the Schools:

The schools were selected to identify the gifted include:

a) Sri. M. Venkata Subba Rao Boys Matriculation Higher Secondary School



b) Bains Matriculation Higher Secondary School (Girls)

c) DAV Higher Secondary School (Co-educational)

From the above mentioned three schools, Sir. M. Venkata Subba Rao and Bains Matriculation Schools were selected to conduct the creativity enrichment programmes, for the following 2 reasons.

1. Both schools rendered their utmost cooperation and help in making the enrichment programme a success
2. They enabled a comparison of children from both sexes

Selecting the Sample Size:

Based on teacher nominations, 200 children (100 boys, 100 girls) of age 7-12 years studying in the grades 3-7 were administered the Wechsler Intelligence Scale for Children (WISC) in order to identify the gifted children. Table I given the distribution of gifted children identified by the Wechsler Intelligence Scale for Children.

Wallach and Kogan's Battery of Creativity Instruments (adapted by Parmesh, 1971) was utilized to assess the creativity the students.

Selection of the Method:

The method selected for the present study is an "observation cum experimental method".

TABLE-I

IQ	Classification	Percent Included
130 and above	Very Superior	2.2
120 - 129	Superior	6.7
110 - 119	Bright Normal	16.1
90 - 109	Average	50.0
80 - 89	Dull - Normal	16.1
70 - 79	Borderline	6.7
69 and below	Mentally Defective	2.2



TABLE - II (a)

Table Showing the Distribution of Children  
According to Age and Sex

Age Group (in years)	Number of Subjects		Total
	Boys	Girls	
7 to 8	30	30	60
9 to 10	40	40	80
11 to 12	30	30	60
Total	100	100	200

TABLE - II (b)

Table Showing the Distribution of Gifted Children  
According to Age and Sex Who Attended Enrichment

Age Group (in years)	Number of Subjects		Total
	Boys	Girls	
7 to 8	10	10	20
9 to 10	15	15	30
11 to 12	10	10	20
Total	35	35	70



TABLE - III

Table Showing the Distribution of Gifted Children According to Ordinal Position and Sex

Ordinal Position	Number of Subjects		Total
	Boys	Girls	
Only	5	10	15
First	15	15	30
Last	15	10	25
Total	35	35	70

6. Development of the Enrichment Programme for Fostering Creativity Among the Gifted:

The purpose here is to provide a description of the design and implementation of the various activities which were used to enrich creativity among gifted children and program also the program evaluation. However, because these areas were so intimately connected for example, evaluation led to program changes which, in turn led to implementation and so forth, they will not be separated by these artificial divisions, but rather described in the way things really happened.

History of the Setting:

The After School/Saturday program was established at the first two schools mentioned above. These schools are under the State Board,



Private and located in an affluent urban community. They serve both upper middle and middle class children.

In our country not much research has been done on gifted children, especially in the areas of enrichment of creativity in the gifted. Due to lack of proper standardized programs available for the above purpose and also due to time factor the investigator had to procure a few enrichment kits from one of the famous universities in the United States of America, which specializes in the qualitative education of gifted children. The main objective of these kits were to foster creativity among the gifted. A few of the activities were modified to suit the Indian conditions to help children achieve better. The enrichment activities had the main purpose of stimulating the children's imagination, fluency, flexibility, divergent and convergent thinking skills. Each of these activities served to incorporate thinking skills and imaginative capacities over and above the requirement for the grade. The enrichment activities were planned along Guilford's divergent thinking operations in which one's thoughts are free to roam in many different directions as possible. The main study was commenced. The enrichment activities, their objectives and method of administration were adopted entirely from the following mentioned enrichment kits.

W. It was a Dark and Stormy Frog by Mariji Gold - Vuskon Illustrated by Michael Gold - Vakson - Line Masters



2. Sprouts Projects for Creative Growth in children by Harriet Hope, Green and Dr. Sue Gillespie Martin - Illustrated by Gerald Milton

3. Thinking Upside Down by Doris Metcalf - Illustration by Michael Gold Yukson.

The Enrichment experiment was conducted according to the various enrichment variants as depicted in the diagram

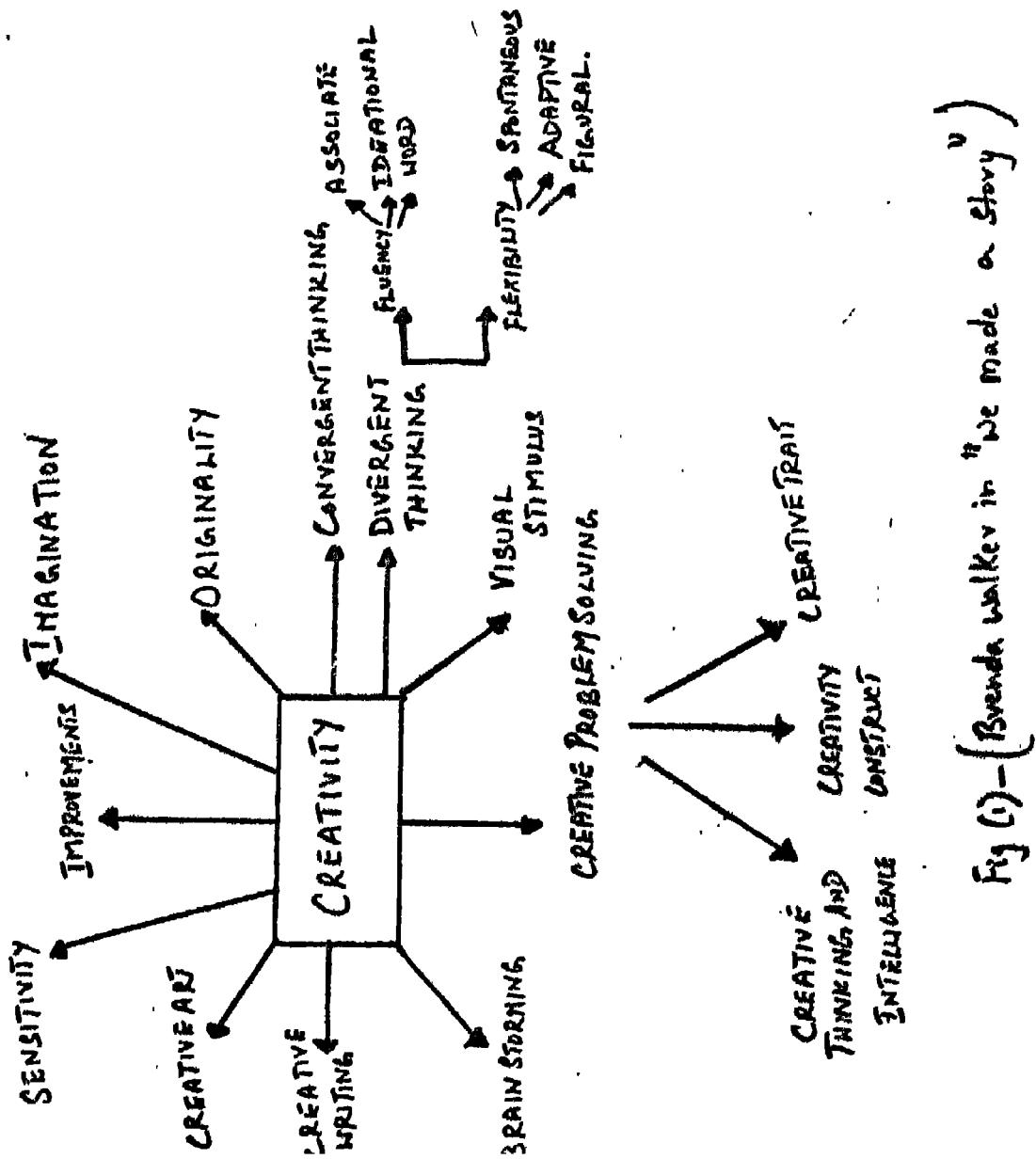
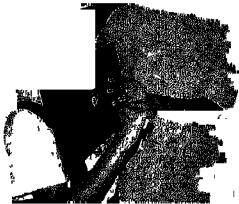


Fig (1) - (Brenda Walker in "We made a story")



Visual (2) gives glimpses of a multifaceted approach to fostering creativity in the gifted



speak volumes : Identify the emotion

A Creative Artist at work



More later tomorrow



Each of the enrichment activities has its own set of objectives, principles and operational pattern. The enrichment consists of three major aspects. They include:

1. The major objectives of the experiment
2. The enrichment activities categorized according to enrichment variants
3. Students' responses for each activity

7. Description of the Enrichment Program:

The enrichment programme to foster creativity among gifted children laid special emphasis on acquiring many fundamental skills which are basic to learning. These skills include:

1. Skill in Discussions
2. Skill in Creative Writing
3. Skill in Problem Solving
4. Skill in Creative Art
5. Skill in Divergent Thinking
6. Skill in Convergent Thinking
7. Skill in Fluency
8. Skill in Flexibility
9. Skill in Originality
10. Skill in Imagination

According to Epstein (1979) horizontal enrichment refers to expanding sideways. The gifted children do not move up any faster, but their learning is enriched by different curriculum materials, individual



instruction, emphasis on the higher mental process of divergent thinking and creative independent study, problem-solving projects with real objects, and any number of techniques that give youngsters a welcome change from the routine of the regular classroom. Keeping the objectives of skills development throughout the enrichment programme in mind, the enrichment activities were given to the student.

Description and Administration of the Enrichment Activities:

Enrichment Variant-I

Creative Development of Originality:

The major aim of this variant was to produce unusual far-fetched, remote or clever responses or uncommonness of ideas among the elementary gifted students. The chief objective of this variant includes:

1. a) to introduce concepts of biography and descriptive writing
- b) to stimulate the imagination
2. to develop the ability to see unusual consequences of impossible events
3. to develop creative innovativeness and inventive capacity in the child
4. to develop a forced relationship between two unrelated objects in order to stimulate ideas

The following enrichment activities were given to the gifted children for the development of originality:

1 (a and b) In order to introduce the concepts of biography and descriptive writing and also to stimulate the imagination, a picture of "Mr. Who" and a sheet of paper were given to each child. A general discussion between the subjects and the investigator followed regarding.



Who was Mr. Who?

Where was he born?

Who are his parents?

What does he eat?

What was his childhood size?

Stimulating questions like How does Mr. Who dress? With whom does it play with? and What are its hobbies? were put forth. Imagination was further stimulated by questions like: Who were his childhood friends? What kind of school would we have attend?

They were asked to write a "biography" on Mr. Who to create a life for him. The meaning of a biography was explained to the students by the investigator and the children were asked to write the same about Mr. Who using their imagination to create a life for him. The students' responses to the general oral discussion of Mr. Who, clearly revealed that their imagination was working. This was revealed in the different responses every child gave to different questions put forth to them.

## 2. Suggest Consequences for Improbable Events:

Suggest consequences for improbable events was another enrichment writing activity which paved the way for "unusualness" and "flexible" innovativeness in thinking. The improbable events given to them were:

- a) What will happen if the roof of a room becomes the floor and the floor becomes the roof?



- b) Clever human beings land on earth in large number from another planet
- c) All human beings suddenly become deaf

The above events are called "improbable" as the possibility of their occurrence is nil. The children have to stretch their imagination to consider the possibility of this impossibility. They have to be original in their descriptions of the event..

3. To Develop Creative Innovativeness and Inventive Capacity in the Child:

- a) In order to stimulate "creativity" and a "sense of humour" through the principle of incongruity, the subjects were asked to create non-existent animals using a combination of several existing animals. Which was named as "Jungle Jokes". For examples, the non-existent animal could have the body of a lion, head of a duck, horns, dragon's tail, legs belonging to different animals and so on.
- b) To stimulate "inventiveness" the gifted subjects were asked to create a new invention, which might become a common one in 10-15 years time. For this activity, the children were asked to form into small groups of three and each of the group was asked to create an invention and draw it.
- c) In order to develop inventiveness and see the problems in a light vein, the concept of "Homework Bubble Inventors" was introduced by reading the poem "Homework" to the class. Each child was <sup>expected</sup> to invent a homework bubble by incorporating lists of things he/she likes into it, thereby making homework more fun.

Each student was asked to make a list of his likes and dislikes. Then they were asked to invent a "homework bubble" by drawing it. To it,



they were asked to incorporate the list of things, they like, while studying. For example, if soft drinks, eating chips and listening to music; having their backs supported while studying - were a few of the child's likes. Each subject was asked to invent and play around with crazy ideas to improve his mood while studying.

For example, the subject could incorporate a soft drink machine connected to an easy chair which has an automatic back scratcher fixed to it in a home bubble showing the things he likes. In this way, homework becomes more fun.

d) To encourage inventiveness and flexibility of thoughts, subjects were divided into groups and each group was given a set of the same materials - cellophane, mud, paper, feltpen, pins, straw containers. Each group was asked to invent a game using all or a few of the given materials. After deciding the game, one member from each group was asked to come and demonstrate to the other as to how it could be played.

4. To Develop a Forced Relationship Between Two Unrelated Objects in Order to Stimulate Ideas:

The subjects were asked to "Create a Forced Relationship" between two unrelated things using the given checklists and the other object being "shoe". An oral attempt was made by the different groups of children to derive a relationship between the shoe and every item given in the following checklist.



Checklist:

toy	waste paper basket	wheel
apple	comb	book
suitcase	pocket	star
socks	tooth brush	ash tray
bottle	hook	bed
window	chain	dog

Enrichment Variant-II

Creative Development of the Arts:

The major goal of the second enrichment variant, namely, art enrichment is to enable them to unlock their unique creative potentials. The chief objectives of this enrichment variant are;

1. To nourish artistic talent
2. To stimulate imagination in artistic representation of themes
3. To develop fluency and flexibility in representing the themes
4. To enable pictorial representation of story through models called mobiles

The following enrichment activities for creative development of the arts were utilized:

a) Representing a Theme Artistically:

The gifted children were asked to choose a theme from two given ones and represent it artistically through drawing or painting. The themes given to them were in: a) Landscape b) Fashion show. Each child represented



his/her work artistically using colours. This activity enabled the children to stimulate imagination and give vent to the free expression of their emotions.

b) Think of Different Materials Which You Can Use to Form Your Names:

To develop a flexible & non-traditional approach to common activities the children were asked to think of the different material with which their names could be formed/written. Then each subject was asked to form its name on chart paper using different materials such as pulses, jigna, feathers, twigs, small stones, beads.

c) Straw Painting:

In order to stimulate the child's imagination, each child was asked to blow through a straw onto a paper having a few drops of paint to form different and unusual patterns. He was given full freedom to blow onto the paper in any direction he felt like. This stimulated the imagination in creating different and unusual pattern.

d) Construction of Mobiles:

Mobiles are pictorial representations of themes or stories to facilitate easier and quicker understanding of the same by just giving a glance. The materials used are coat hanger, sketch pens, thread, equal sized square pieces of still paper.

The mobile can be constructed by first positioning three coat hangers as shown in Fig.2. The children were asked to pictorially represent themes. Eg. birds, animals or stories on mobiles. The themes to be



represented pictorially were drawn on stiff cardboard paper, coloured and fastened on the hangers through the threads. The main theme which represented the essence was hung in the middle of the central hanger. The subjects were asked to make mobiles on the stories they had written by selecting parts, when drawn, explained the whole story.

d) The subjects were given some chart paper, ordinary paper and were asked to make constructive objects using them. They were allowed to use additional construction materials such as thread and sketch pens.

#### Enrichment Variant III - Development of Problem Solving Ability

##### 1. Soft Drink Opener:

The children were given the following instructions "Suppose you are on a picnic, you have a bottle of soft drink but you did not bring an opener. List the ways in which you can open the bottle to drink the soft drink without cutting the mouth or swallowing glass". They were asked to list the ways in which the bottle could be opened.

##### 2. Force in Charge:

The children were given sheets of plain paper and were asked to list the different and unusual ways in which a chair could be moved without touching it.

##### 3. Field Trip:

Following instructions were given to the subjects. "Pretend that you and Your Classmates are on a field trip when your bus breaks down. You



have to spend the night in the woods. List the various problems you will face and the different ways you propose to solve them".

4. Moon Colonization:

Imagine that you are the Head of an expedition assigned to colonize the moon. Only ten different people with ten different professions can go with you". The children were asked to write down the kind of workers they would take and the reasons for selecting them.

5. School Problem:

The children were asked to "find out a problem in your school and different ways in which you propose to solve it".

Enrichment Variant IV - Development of Imagination:

The term imagination is synonymous with the word creativity. The major goal of this enrichment variant is to produce an essentially new product, constructive in nature. It could be developed with the employment of past perceptual experience. The chief objectives of this enrichment experiences include:

- a) To develop visual awareness of objects
- b) To develop imaginative awareness of the sounds found in different environments
- c) To help children develop imaginative skills in creating new ideas

The following enrichment activities were administered to develop imagination among the gifted:



1. National Holiday:

The subjects were asked to imagine that they have been selected to create a "New National Holiday". They were given the following instructions.

"You are assigned to create a "National Holiday". Select a name for your holiday, decide the reason for the holiday, assign an appropriate month in which to have it, and determine how you will celebrate it.

2. Report Card:

The children were given the pleasure of designing a report card for teachers. The Report Card was to be designed to evaluate the teachers on aspects of a) emotional b) performance and the manner in which(a) and (b) were to be evaluated. The children also had to determine what will happen to teachers who score poorly on the report cards. The subjects were asked to illustrate the outside and inside of the Teacher Report Card.

3. Attention Please:

The next activity was "Attention Please". The children were asked to use their imagination and write down the different ways in which it is possible to get someone's attention.

- a) From the above list which would most likely command attention and why is it so?
- b) Which is the method that would command the least attention and why is it so?



4. Peephole Guesses:

As the title suggest<sup>s</sup>, it determines the ability to visualize the whole object by seeing only part of it. The children were asked to sit in a semi-circle and part of the object or picture was revealed to them from behind a screen which had a small peephole in it. They had to guess what the picture was. Objects used were: ball, sponge, cello tape, pictures of shoe, car.

5. Creepy Creatures:

This activity involved planning olympic games for the creepy creatures. The children had to plan what creepy creatures or animals were competing, what were the important rules for the competition and the illustration of the "Olympic Mascot" was to be done.

6. Environments:

The children were divided into groups of 4-5. Each group was assigned an environment - a) Farm b) Circus c) City-Show d) Basket-Ball Game e) Haunted House. The subjects were asked to think of all the sounds possible in each environment.

7. Plan A Party:

The children were asked to:

- i) Plan the perfect birthday party
- ii) Who will be invited?
- iii) Where will the party be held?



- iv) Write your menu down
- v) Describe the decorations to be used
- vi) Design your own party invitations showing both the inside and outside

8. Busy Housekeeper:

In order to cut down work for a house-keeper, to make her work easier, and to reduce her fatigue, the children were asked to draw the blue prints of a step-saving house which will facilitate easier cleaning.

9. Science Lesson:

The gifted were given the task of planning a science lesson. They were divided into equal number of groups and each group was asked to plan the following.

- i) Plan a science lesson for a second grade class. Give it a title
- ii) What are the specific goals of your science lesson?
- iii) What are the activities you will have for your lesson?
- iv)

10. Future City:

The children were given the following instructions: " you are given the task of planning the 'Ideal City' of the future".

- i) What name will you give for your City and Why?
- ii) What kind of buildings and other structures will be included in the City?
- iii) Where will people live, work, play?



- iv) What sort of transportation will be used?
- v) Will the city have a code of laws or rules?
- vi) What makes your city ideal?

#### 11. Animal Intelligence Test;

Designing an intelligence test for animals was the next activity given to the children. The children were asked to try it out on their pets and evaluate the results.

#### Enrichment Variant V : Visual Stimulus Enrichment:

The major aim of visual stimulus was to stimulate the higher level of consciousness improving the levels of imaginary fantasy and imagination. The chief objectives of this enrichment variant includes:

- a. To enable effective communication without words
- b. To enable children use their bodies in creative expression
- c. To facilitate the development of creative writing skills
- d. To enable the child's ability to visualize items through explorations
- e. To encourage the children to communicate feelings
- f. To introduce the concept of homonyms
- g. To developdividednessof imagination, originality

The following activities were given to the subjects for their visual stimulus enrichment.

1. Who Said Michaelangelo?: This was an interesting game to enable the gifted children to communicate without words and also encourage them to work together. The materials used were black board, chalkpiece, a box full of odd articles.



Procedure:

The children were divided into two teams. Each team member was given a number. The investigator called out a number. The student with that number from each team went to the investigator. The investigator showed the two students one item from the box of odd articles. The student drew the picture of the article on the board. The team that discovered the identity of the picture first got the point. The investigator called for another two students each from the two teams and new articles was shown. This procedure was repeated till <sup>all</sup> the members have had a chance to draw. The team with most points was declared the winner.

2. Pencil Pick: This is again an interesting game to develop the ability to visualize items by exploring their sizes, shapes, textures and weights of pencils of different sizes and shapes. The materials required are pencils of different sizes, shapes and bag.

Procedure:

The children were made to sit in a circle. The children were given a pencil each. They were asked to feel its shape, size, texture, and other details. Then they were asked to mark their initial on the pencil somewhere. All the children were made to put their pencils in the bag. The investigator shook the bag nicely. One by one, the children took turns to reach into the sack and tried to find their respective pencils by touching only and not looking into the bag. Whether each child was able to find the correct pencil or not, the investigator made sure that the pencil was put back into the sack before the next child tries.



4. Identify the Emotion: In this the subjects were asked to "pick out any emotion from a given lot and convey it to others only through your eyes and hands, keeping other parts of the face concealed behind a screen.

Procedure:

To enable the children <sup>to</sup> communicate feelings and emotions to others through visual expression and gestures, the investigator divided the children into two groups. Each team member was given a number. The investigator called out a number. The children with that number from both teams came to the investigator. They draw out a piece of paper from a given lot of papers. The paper has an emotion written on it. The children, in turn, expressed their emotions only through their eyes and hands. The investigator revealed only the child's eyes and hands while miming and covered the rest of the face. The team which was able to guess the correct emotion first got the points. Then, the investigator called another number and one student from each team came to the investigator and picked out a paper from the lot. This procedure was continued till all the members had a chance to mime. The team with most points was declared as the winner.

5. Pairs of Pears: The investigator produced the concept of homonyms (word of the same form as artisic <sup>tic</sup> but different sense). The investigator introduced the concept of homonyms through a game. She explained the meaning of homonyms.

Procedure:

The entire lot of children were put into pairs. A homonym pair card was handed over to each pair. Student A mimed one word in the mononym pair

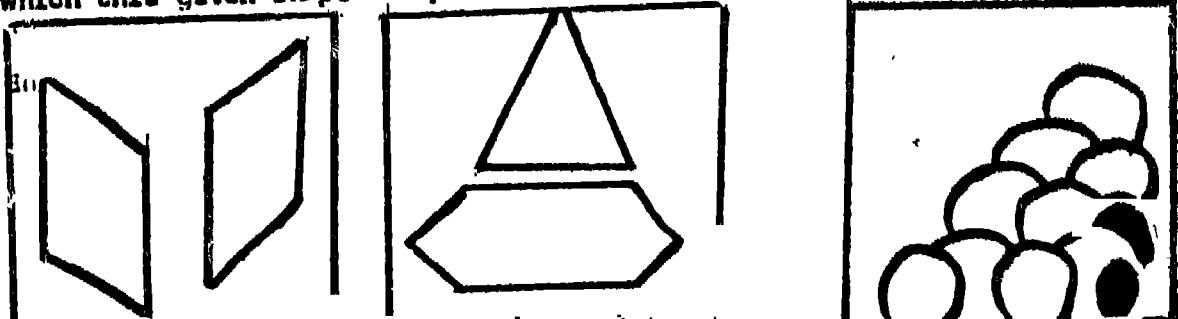


and student B mimed the other word in the homonym pair. The rest of the class tried to guess what the homonym was. The following homonyms pair cards were used:

Pair	Pear	Scene	Cent
Rain	Rein	Flower	Flour
Hare	Hair	Peak	Peek
Sun	Son	Rap	Wrap
Two	Toe	Tail	Tale
Fair	Pare	Bare	Bear

#### 6. Shape Completions:

The main aim in shape completions is to develop visual imagination and originality. The investigator showed each child, picture of different kinds of shapes. The children had to think of all the possible objects of which this given shape was part of. Examples of given shapes are:



#### Enrichment Variant VI: Sensitivity Enrichments

The major goal of this variant was developing an awareness of unusual needs to already existing things in the environment. Common things for which improvement or modifications can be made was developed through this variant. The chief objectives of sensitivity enrichment includes.



- a) Development of divergent thinking
- b) Development of problem-solving skills
- c) Development of Imagination and Fantasy

The following activities were given to the subjects for sensitivity enrichment:

1. Improvements for common objects:

The common objects given were a) tooth brush b) bed c) automobile  
d) pencil e) washing machine. Each child was given the common object to be improved and was asked to write down all the possible ways in which the object can be modified to make it more purposeful, useful and decoration to us.

2. Design-A-Door:

The children were asked to:

- a) Design a new type of classroom door after studying the existing door
- b) Determine what improvements or corrections would be made for the existing door
- c) Determine what materials would be utilised in creating the new door
- d) In what ways are the present door and the new door same and different

3. The Bugs:

The children were asked to list five things which cause irritations to each child and for each irritation or annoyance, two suggestions for solving the irritation.

Enrichment Variant VI:a) Fluency Enrichment:

The main goal of fluency enrichment was to improve the number of objects under study and also the rate at which ideas come into the mind.



The following activities were given to the children to improve their fluency:

- i) The children were asked to draw as many curved things as they can think of
- ii) The subjects were given the following five words:

a) clown b) moon c) hair d) ring e) ball

For each given word, the children had to think of as many words which sounded like the given word.

b) Flexibility Enrichment:

The main goal of flexibility enrichment was to enable the individual to strike out in a number of different directions in one's thinking.

Enrichment activities to improve flexibility and fluency were the following:

1. Children were asked to suggest alternate uses for common objects, namely
  - i) newspapers ii) empty cans and iii) tooth brushes
2. Children were asked to think of as many words as possible which should like the given word from the words given below:
  - a) clown b) moon c) hair d) ring e) ball

Enrichment Variant VII - Creative Writings:

The main aim for creative writing was to improve originality of ideas, imagination, depth of understanding emotions, logic of sequence, consistency of the view point choice of expressive words, over and above all-a well-planned plot.

The children were given the following sets of four words each and were asked to formulate their own imaginative story and give <sup>it</sup> a meaningful title:



1. Clown, witch, ring, moon
2. Queen, witch, bird, geast
3. Underwater, jelly, fish, magic, clock, mermaid
4. Snake, charniet, king, box, desert

Enrichment Variant VIII - Creative Drawing:

The children were given the following sets of four words each and asked to illustrate a meaningful scene with all the four words logically inter-connected to make a scene

i) Teddy bear	i) Sunken ship
ii) Bath tub	ii) Bell
iii) Close friend	iii) Treasure
iv) Ball	iv) Coast Guard

Enrichment Variant IX : Brainstorming:

The main aim of brainstorming was to obtain as many ideas as possible on a particular topic in a short time. The pine for brainstorming includes:

- a) Your group has just discovered an "immortality" drug. This makes it possible for you to live forever. Brain storm advantages and disadvantages of such a situation
- b) Suppose that in future, we become dependent on robots, computers, and other highly technical "helpers". Then suddenly, we are forced to live without them. Brainstorm advantages and disadvantages of this situation



Procedure:

The problem under consideration was written on the blackboard by the investigator. The children were asked to suggest as many ideas as possible. Next step involved breaking up the children into groups of 4-5 each and each group discussed the advantages and disadvantages of the problem within themselves. After this, the entire lot of children were grouped into a single unit and one person from each of the former groups gave a picture of the advantages and disadvantages of the condition. Once every group had contributed their thoughts on the topics, the investigator and the class as such went over the entire list of ideas selecting workable ideas, and rejecting unfavourable ones and finally coming to a concrete conclusion about the topic under study.

Data Collection:

The investigator visited a few schools in Madras City to get permission to carry out the study. Principals of the following schools granted permission and extended their help and cooperation for carrying out this investigation. The names of these schools are:

1. Sir M. Venkata Subba Rao Matriculation Boys' School, T. Nagar, Madras-17
2. C.S.I. Bain Matriculation Higher Secondary Schools for Girls, Kellys, Madras-7, and
3. D.A.V. Higher Secondary School, Royapettah, Madras-14

A meeting of the investigator and teachers was arranged by the principal of each school. In these meetings, the investigator enlightened the teachers about the need, objectives of her research work and the



experimental procedure to be adopted. She solicited their help and cooperation. She had assured them that a feed back of the consolidated results would be given to them after the completion of the study.

In order to make the programme achieve its objectives in the fullest sense, the investigator had contacted the parents. The parents were contacted through request letters from the investigators. They were enlightened about the characteristics, identification procedures and various educational programmes for the gifted. They were also oriented about the objectives of the present investigation and were requested to extend their cooperation and encouragement.

a) Identification of the Gifted:

The Identification Programme was carried out in three schools, mentioned above. Two hundred children of grades III - VII were nominated as gifted/talented by their teachers and peers. To these children, systematic tests were administered to revalidate the teachers' nominations.

Weschler Intelligence Scale for Children (WISC) was administered to these 200 children, after establishing rapport with these children through frequent visits to the school by the investigator and interacting with these subjects. Proper seating arrangement was made and sufficient time was given to the children to complete the test. In addition, clear instructions were given by the investigator. The help of the teachers further facilitated the ease of administration of the test. Personal data such as the child's name,



name of the school, date of birth, ordinal position etc. were collected from each subject. Only those children who obtained an IQ scores which is above 130 were included in the present study.

These children were also administered Wallach and Kogan's Battery of Creativity Tests adapted by Paramesh. Their score on creativity assessment gave an indication of the creativity index for each selected children. These scores-obtained by them constituted the pretest scores. The number of children who were identified as gifted were 95.

Administration of the Enrichment Programme to the Gifted For Fostering Creativity:

Prior permission was taken from the Headmasters/Headmistresses of the schools and also the teachers and parents of the gifted children. The class teachers extended their help of the investigator. Only 70 out of 95 gifted who were identified participated in the enrichment programme for a duration of 45 days.

The investigator made frequent trips to these schools in sequence to establish a good rapport with the selected gifted children, to remove their anxiety and make them feel at ease with the investigator. The enrichment programme was conducted to the selected gifted children in their respective schools in small groups for each standard. The programme was administered during the free hours, after school hours or during holidays. The enrichment activities for creativity were flexible. Depending upon the needs and interests of the children, the activities for creativity were conducted. Due to unforeseen causes only seventy out of 95 gifted children able to attend the programme;



The enrichment activities were administered for a period of three hours in each school, every day. The target schools were tackled simultaneously to facilitate proper progress.

After a lapse of 45 days of administration of the enrichment activities to foster creativity, the gifted children were once again, administered the Wallach and Kogan's Creativity Assessment Battery in the same manner as that of pretesting. The scores, thus got now, constitute post-test scores or the creativity index of the children after the enrichment. Statistical analysis of the pre-test and post-test scores of the 63 gifted children was carried out to see whether the enrichment programme had any significant effect on their creativity index.

Statistical Procedure for Data Analysis:

The data thus obtained were tabulated and analyzed by categorizing them according to the different variables for data analysis "t" tests, partial "t" test, F test and correlation analysis were employed. The partial 'E' that was used to determine the significant level in the mean creativity gain scores. The 't' test was employed to compare the increase in creativity scores between gifted boys and girls of the same age groups. F test was used to compare the IQ levels among gifted boys and girls between the different age groups.



"t" test compares the mean of two groups. Statistical procedure includes: Formula

$$\frac{t = \bar{x}_1 - \bar{x}_2}{(\bar{n}_1-1) s_1^2 + (\bar{n}_2-1) s_2^2} \quad \frac{\bar{n}_1 \bar{n}_2 (\bar{n}_1 + \bar{n}_2 - 2)}{\bar{n}_1 + \bar{n}_2}$$

$\bar{x}_1$  = Average gain in creativity scores in I group

$\bar{x}_2$  = Average gain in creativity scores in II group

$s_1^2$  = Standard deviation of creativity gain scores of I group

$s_2^2$  = Standard deviation of creativity gain scores of II group

$n_1$  = Sample size of I group

$n_2$  = Sample size of II group

A computed t is declared significant if it is more than the tabulated  $t_{d/s}(n_1=n_2-2)$

### II. Partial "t" test:

$$/ t / = \frac{D}{SD/n}$$

D= Average difference in creativity scores

SD= Standard deviation of the differences

n= Sample Size

### III. F-Test:

'F' test is done for comparing means of K groups

Suppose the observations of K groups are as follows:



### RESULTS AND DISCUSSION

The data gathered as stated in the previous chapter, were subjected to statistical analysis. The results of the findings are reported and discussed in this chapter under the following sections, namely:

- I. Effect of Enrichment Programme on the Creativity Gain Scores of the Elementary School Gifted Children
- II. Effect of Sex on the Creativity Gain Scores of the Elementary School Gifted Children
- III. Effect of Age on the Creativity Gain Scores of the Elementary School Gifted Children
- IV. Effect of the Ordinal Position on the Creativity Gain Scores of the Elementary School Gifted Children
- V. Relationship between Intelligence and Creativity Gain Scores of Elementary School Gifted Children

I. Effect of Enrichment Programme on the Creativity Gain Scores of the Gifted Children:

The following table displays the effect of the enrichment programme on the creativity gain scores of the gifted boys, girls and children.

TABLE-IV

#### Effect of the Enrichment Programme on the Creativity Gain Scores of the Gifted Boys, Girls and Children

	Mean (Average Scores of Post and Pre-test Creativity Score)	S.d.	't'-value	Table Value of 't'
Boys	46.78	27.03	8.12	1.96
Girls	39.10	31.36	6.82	2.75
Boys and Girls	42.37	29.84	10.33	2.68



Photograph (3) lays special emphasis on the unusualness of creative responses of the gifted



Draw a drawing below

Landscape portrayal



Inspection of the Table IV reveals that the mean increase in creativity score is 46.78. The calculated *t*-value ( $t=8.12; P > 0.05$ ) is greater than the table value (1.96). It may be concluded that boys have shown significant benefit due to the enrichment programme. This finding supports the hypothesis I(a) which expected that enrichment programme to foster creativity will have a definite impact in fostering creativity among the gifted boys.

Table IV also shows that the mean increase in creativity score was found to be 39.10 which is relatively less than the mean creativity gain score of the boys ( $\bar{X}=46.78$ ). As the corresponding '*t*'-value ( $t=6.82; P > 0.05$ ) was found to be higher than the table value (2.75), it may be inferred that the girls also exhibited a significant improvement in their creativity after their exposure to the enrichment programme. Therefore, hypothesis I(b) which expected enrichment to foster creativity among gifted elementary girls is confirmed.

Further observation of Table IV reveals that the average increase in creativity scores, before and after the enrichment experience is 42.37. The calculated '*t*' ( $t=10.33; P > 0.05$ ) is greater than the table value (2.58) and is significant at five percent level of significance. Therefore, it may be inferred that gifted children's creativity scores improved largely after their exposure to enrichment programme to foster creativity. Thus, hypothesis I(c) which expected enrichment to foster creativity among gifted children is supported.



II. Effect of Sex on the Creativity Gain Scores of the Gifted Children due to their Exposure to Enrichment Activities:

Table V displays the effect of sex on the creativity gain scores of the gifted children due to their exposure to enrichment programme.

TABLE-V

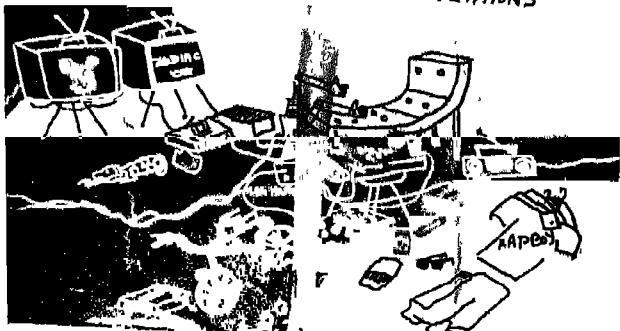
Effect of Sex on the Creativity Gain Scores of the Gifted Children due to their Exposure to Enrichment Programme

Age Group	Sex	N	Mean Gain Score	S.d.	Difference in Score	S.d.	't'
7 - 8	Boys	10	54.7	33.8	31.2	11.1	2.1
	Girls	10	23.5	9.3			
9 - 10	Boys	15	77.3	40.7	29.3	13.1	2.2
	Girls	15	48.0	30.4			
11 - 12	Boys	10	57.8	36.9	17.7	16.2	1.1
	Girls	10	40.1	35.3			

Table V shows that at all the given ages, that is, 7-8, 9-10 and 11-12 years, gifted boys obtained relatively greater improvement in their creativity levels which may be attributed to their exposure to enrichment programme. Among the 7-8 year olds the difference in the mean creativity gain scores of the boys ( $\bar{X}=54.7$ ) and girls ( $\bar{X}=23.5$ ) is significant ( $t=2.81; P > 0.01$ ). Boys of 9-10 obtained maximum creativity gain score ( $\bar{X}=77.3$ )



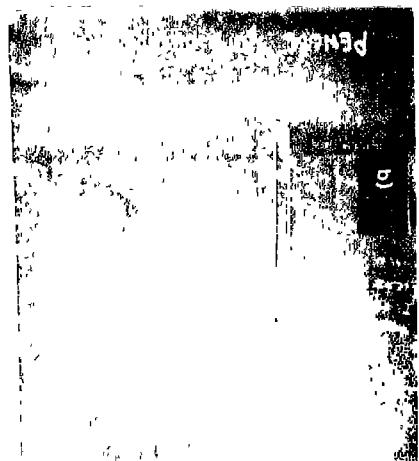
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M. NIS

MOVIEMAN - pencil style





compared to the girls ( $\bar{X}=30.4$ ) and this difference is significant ( $t=2.24$ ;  $p < 0.05$ ). Among the 11-12 year olds boys secured a relatively higher mean creativity gain score ( $\bar{X}=57.8$ ) than the girls ( $\bar{X}=35.3$ ). However this difference failed to reach statistical significance as the calculated  $t$ -value ( $t=1.1$ ) was much less than the table value. Therefore, hypothesis III(b) is accepted partially.

Table VI shows the effect of sex on the creativity gain scores of gifted children of the same ordinal position

TABLE-VI

Effect of Sex on the Creativity Gain Scores of Gifted Children of the Same Ordinal Position

Ordinal Position	Sex	N	Mean Gain Score	S.d.	Difference Score	S.d.	't'
Only	Boys	5	58.2	13.2	16.2	11.4	1.42
	Girls	10	42.0	23.5			
First	Boys	15	65.2	31.5	27.2	10.9	2.5
	Girls	15	38.0	28.2			
Youngest	Boys	15	68.3	31.2	24.8	12.3	2.01
	Girls	15	23.5	28.4			

Table VI reveals that there is a large difference (27.2) in the mean gain scores of the first born girls and boys, followed by the youngest (24.8)



and the only child (16.2). The mean gain scores of the first born boys was 65.2 while that of the girls was only 38.0. Similarly the mean gain score of the youngest boys was 68.3 whereas that of the girls was 23.5 "Only Boys" secured a mean gain scores of 58. while that of the girls was 42.0. In general boys of all the three ordinal positions seems to have gained from the enrichment programme to foster creativity compared to the girls.

In regard to the effect of sex on the creativity gain scores of gifted children (belonging to the same ordinal positions) it was found that only in the case of first borns, significant sex difference ( $t=2.5; P < 0.05$ ) was present while the apparent sex difference in the mean creativity gain scores of the only ( $t=1.42$ ) and youngest born children ( $t=2.01$ ) did not reach statistical significant. It may be concluded that there is a significant sex difference in the mean creativity gain scores of the first born children. Hypothesis III(a) which expected that there would be no sex difference in the improvement levels of creativity of elementary gifted children of different ordinal positions is partially supported.

### III. Effect of Age on the Creativity Gain Scores of the Gifted Boys, Girls and Children Who Exposed to Enrichment Programme:

Table VII shows the effect of age on the creativity gain scores of the gifted boys exposed to enrichment programme.



TABLE - VII *IV*

Effect of Age on the Creativity Gain Scores of the Gifted Boys Exposed to Enrichment Programme

Age Group (in year)	N	Mean Scores Pre-test	Mean Scores Post-test	Mean Gain	S.d.	't'-value
7 - 8	10	19.0	73.7	54.7	33.8	5.1
9 - 10	15	22.8	100.1	77.3	40.7	7.3
11 - 12	10	28.5	86.3	57.8	36.94	4.95

Inspection of Table VII shows that among the three age groups, 9-10 year olds obtained the largest mean gain score ( $\bar{X}=77.3$ ) followed by 11-12 years old ( $\bar{X}=57.8$ ) and 7-8 year olds ( $\bar{X}=54.7$ ). The observed difference in the mean creativity gain scores of the gifted boys was statistically significant for 7-8 year olds ( $t=5.1; P<0.05$ ), 9-10 year olds ( $t=7.3; P<0.05$ ) and 11-12 year olds ( $t=4.95; P<0.05$ ). As all these t-values are statistically significant it may be inferred that age had a significant effect on the creativity gain scores of the gifted boys, who were exposed to enrichment programme. Thus hypothesis IV(a) is supported.

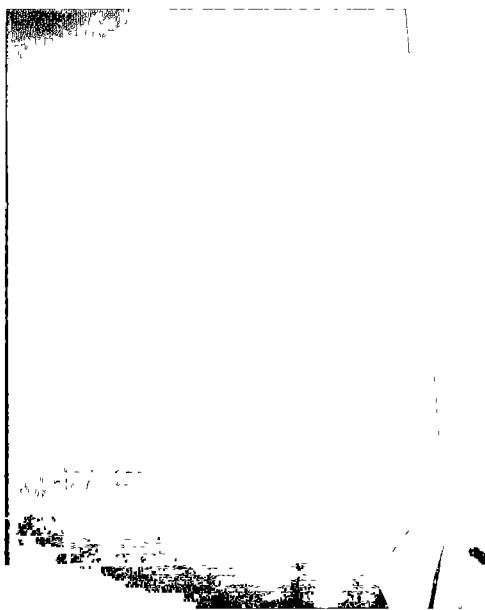
Table VIII shows the effect of age on the creativity gain scores of the gifted girls exposed to enrichment programme.

TABLE-VIII  
Effect of Age on the Creativity Gain Scores of the Gifted Girls Exposed to Enrichment Programme

Age Group (in year)	N	Mean Score Pre-test	Mean Score Post-test	Mean Gain	S.d.	't'-value
7-8	10	31.8	55.3	23.5	9.3	8.0
9-10	15	50.5	98.5	48.0	30.4	6.1
11-12	10	48.5	88.6	40.1	35.3	3.6



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8 1/2" x 11" 250

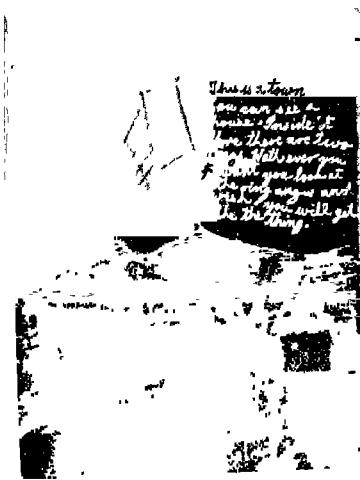




Table VIII shows that even among the gifted girls, 9-10 year olds displayed maximum gain in creativity ( $\bar{X}=48.0$ ) followed by 11-12 year olds ( $\bar{X}=40.1$ ) and 7-8 year olds ( $\bar{X}=23.5$ ). The calculated t-values for 7-8 year olds ( $t=8.0$ ;  $P < 0.05$ ), 9-10 year olds ( $t=6.1$ ;  $P < 0.05$ ) and 11-12 year olds ( $t=3.6$ ;  $P < 0.05$ ) were found to be significant. This leads to the conclusion that significant difference are present in the creativity gain scores of the gifted girls of different age groups due to exposure to enrichment programme. Thus hypothesis IV(b) is supported.

Table IX shows the effect of age on the creativity gain levels of elementary school gifted children.

TABLE-IX

Effect of Age on the Creativity Gain Levels of Elementary School  
Gifted Children

Age Groups	Mean Difference	S.d.	F.value	Table Value
7 - 8	43.0	19.64	0.47	2.86
9 - 12	48.0	28.80		

\* Mean Differences = Average increased score of (Post-Test Creativity Score - Pre-test Creativity Scores)

Table IX shows that the mean difference in the creativity gain scores of 9-12 year olds ( $\bar{X}=48.0$ ) is higher than the 7-8 year olds ( $\bar{X}=43.0$ ). However, the observed difference in the mean scores did not reach statistical significance as the calculated F-value ( $F=0.47$ ) was much less



than the table value of F (2.86) at five percent level of significance. From this it can be inferred that age did not have any significant impact on the creativity improvement levels of the gifted children as the difference between 7-8 and 9-12 year olds was found to be not significant.

IV. Effect of the Ordinal Position on the Creativity Gain Scores of the Elementary School Gifted Children:

Table X shows the effect of ordinal position on the creativity gain scores of elementary school gifted boys.

TABLE - X

Effect of Ordinal Position on the Creativity Gain Scores of Elementary School Gifted Boys

Ordinal Position	N	Mean Scores Pre-test	Mean Scores Post-test	Mean Gain	S.d.	't'
Only	5	21.2	79.5	58.3	13.2	9.8
First	15	24.4	89.5	65.1	41.5	6.07
Last	15	92.5	68.3	64.2	41.3	6.4

It may be seen from Table X that the only, first born and last born gifted boys showed considerable improvement in their creativity scores. The difference in the pre and post enrichment creativity mean gain scores for the only child, first born and last born are 58.3, 65.1 and 64.2 respectively. First born children seemed to have gained mostly, followed by last born and the only children.



't' tests were employed to test the significance of a difference between ordinal position and the mean creativity gain scores of the gifted boys. The calculated t-values for the only child ( $t=9.8; P < 0.05$ ), first born ( $t=41.5; P < 0.05$ ) and last born ( $t=6.4; P < 0.05$ ) were highly significant. Thus, it can be inferred that there exists a significant bearing of ordinal position on the creativity gain score of gifted boys. Thus hypothesis II(a) is rejected.

Table XI displays the effect of ordinal position on the creativity gain scores of the gifted elementary school girls.

TABLE - XI VII  
Effect of Ordinal Position on the Creativity Gain Scores  
of Elementary School Gifted Girls

Ordinal Position	N	Mean Score Pre-test	Mean Score Post-test	Mean Gain	S. d.	't'
Only	10	49.3	91.3	42.0	33.5	3.96
First	15	44.4	82.4	38.0	28.1	5.24
Youngest	10	46.9	90.4	43.5	33.3	4.1

Table XI shows that the mean creativity gain scores of the youngest child ( $\bar{X}=43.5$ ) was the highest followed by the only child ( $\bar{X}=42.0$ ) and the first born ( $\bar{X}=38.0$ ). In other words, youngest children seemed to have improved their creativity gain scores as compared to the only and first



borns. The calculated t-values for the only child ( $t=3.96; P < 0.05$ ) first born ( $t=5.24; P < 0.05$ ) and youngest ( $t=4.1; P < 0.01$ ) were found to be higher than the table values ( $t=2.06; 1.96$  and  $2.58$  respectively). Hence it may be inferred that the ordinal position of the gifted girls had a definite bearing on their creativity gain scores. Thus hypothesis II(b) is not confirmed.

V. Relationship Between Intelligence and Creativity Gain Scores of the Gifted

Boys and Girls:

Table XII shows the relationship between intelligence quotient and creativity gain scores of elementary gifted boys and girls.

TABLE-XII  
Relationship Between Intelligence Quotient and Creativity Gain  
Scores of Elementary Gifted Boys and Girls

Age Group	Size of Sample		Correlation	
	Boys	Girls	Boys	Girls
7 - 8	10	10	0.6	0.89
9 - 10	15	15	0.6	0.76
11 - 12	10	10	0.42	0.71

Table XII shows that significant relationship exists between IQ and creativity gain scores of the 7-8 year old (0.6) 9-10 (0.6) and 11-12 year old (0.42) gifted boys. Similarly significant correlation existed



between IQ levels and mean creativity gain scores for gifted girls of 7-8 year old (0.89), 9-10 year old (0.76) and 11-12 year old (0.71) gifted girls. Therefore hypothesis V(1) (a) and (b) are accepted.

Table XIII shows that relationship between intelligence quotient and creativity gain scores of elementary gifted children.

TABLE-XIII  
Relationship Between Intelligence Quotient and Creativity Gain Scores  
of Elementary Gifted Children

Sex	Age Group	N	$(X - \bar{X})^2$	$(Y - \bar{Y})^2$	$(X - \bar{X})$	$(Y - \bar{Y})$	r
Boys	7-8	10	1083	6868	8668	0.6	
Boys	9-10	15	2631	21580	4784	0.63	
Boys	11-12	10	346	13648	910	0.42	
Girls	7-8	10	59	435	143	0.89	
Girls	9-10	15	79	12952	777	0.76	
Girls	11-12	10	289	11227	1284	0.71	

In order to test the significance of relationships between intelligence quotient and creativity gain scores among the gifted children, correlation analysis was carried out and the results are presented in Table XIII. The coefficient of correlation was calculated for each age group for both sexes. It can be seen that a positive correlation was found between the two among 7-8



year old gifted boys ( $r=0.6$ ) and girls ( $r=0.89$ ) 9-10 year old gifted boys ( $r=0.63$ ) and girls ( $r=0.76$ ) and 11-12 year old gifted boys ( $r=0.42$ ) and girls ( $r=0.71$ ). A close observation of the table shows that the correlation value obtained by the gifted girls were relatively higher than the gifted boys. The highest coefficient of correlation values obtained by the gifted girls were relatively higher than the gifted boys. The highest coefficient of correlation between IQ and mean creativity gain scores was observed among gifted girls of age group 7-8 years. Hypothesis V 1(c) is accepted.

DISCUSSION:

The general trend of the results indicate that overall, there is a consistent gain in creativity scores after their exposure to enrichment to foster creativity among a) 7-8 year old gifted boys ( $\bar{X}=54.7$ ) and girls ( $\bar{X}=23.5$ ); b) 9-10 year old gifted boys ( $\bar{X}=77.3$ ) and girls ( $\bar{X}=48.0$ ) and c) 11-12 year old gifted boys ( $\bar{X}=57.8$ ) and girls ( $\bar{X}=40.1$ ). Therefore it may be inferred that the enrichment programme to foster creativity has caused an overall significant improvement in the creativity of the gifted children, irrespective of their ages.

The results as obtained in the present investigation may be attributed to the following facts. The selected enrichment activities provided the required enrichment quickly and fostered the child's innate creative capacities in the aspects of fluency, flexibility, originality and imagination. Increasing opportunities for individual activities led



all the gifted children to penetrate more deeply and pursue an activity or develop a skill until they became proficient in it. In doing so, they not only satisfied their curiosity about it, but also reach a sense of 'closure' a feeling of completion. Opportunities provided for gifted children enabled them to broaden<sup>w</sup> their experiences by working in areas not ordinarily explored by the average child.

Provision of abundance of resources served as a catalyst for creative potential. It implies that every child should have access to a wide range of materials on a variety of subjects. These creative activities which can be given to individuals or group activities, may be relatively of short duration and may be assigned by the teacher or may grow out of pupils' individual interest. They may include any activity which motivates the child to learn and those that are of interest to him.

This enrichment programme had much potential. This programme had incorporated the principles and methods of enrichment as listed out by Dunn (1978), hence it succeeded 1. There was emphasis on creative and experimental activities 2. Emphasis on developing skills of investigating and learning 3. Independent work, involving initiative ordinality 4. High standards of accomplishment 5. Opportunities for leadership and social adjustment 6. Individual attention from the investigator 7. First hand experience 8. Flexibility of organization and procedure 9. Extensive reading 10. Concern in community responsibility.)



Provision of a reward system for innovative behaviour and above all a chance for self-discovery of creativity challenged the gifted children to undertake problem solving and original work beyond the <sup>ir</sup> interest and abilities.

The present study lends support to the various views advanced by educationists to make special provisions for the enhancement of the creativity as well as education of the gifted children. It may also be concluded that enrichment definitely opens channels for creativity to develop. Although the cost of such an enrichment programme may be high, the enthusiasm and ingenuity of the teachers of the school can go a long way in implementing effective enrichment on small budgets. It must be stressed that Indian Schools must seriously consider broadening the curriculum to include handicraft, clay modelling, the fine arts such as music, dance, painting, drama, creative writing of original stories and poetry.

The above findings correspond to the studies of Fearn (1976) Alencar and Widlake (1976), Nojiko (1978), Meeker (1978), Meeker and Mary (1978), Cheleb (1981), Colangelo (1983), Kirschenbaum (1984), Delchos, Bransford and Haywood (1984), Sloan and Stednitz (1984), Karnes, et al. (1985), Ebmiet, et al. (1984), Long and Hiebert (1985), Bruch (1986) Van Tassel Baska (1986) Carter and Kuechenmister (1986), Gaskin, et al. (1986) and Johnson (1987), which support the view that creativity can be developed through appropriate



enrichment programme. However, the present findings contradict those of Canton, Klein and Halfat (1979), Gratz and Pulley (1984) who believed that placing a child in a gifted program could adversely affect the self-esteem of personality adjustment of sibling<sup>s</sup> not so placed and also on creativity.

Effect of Sex:

(Gifted boys, as a whole excelled the girls in their overall improvement in the creativity gain scores ( $\bar{X}=54.7$ ; 77.3; and 57.8) for 7-8, 9-10 and 11-12 year olds as compared to the gifted girls ( $\bar{X}=23.5$ ) 48.0 and 40.1) for 7-8, 9-10 and 11-12 year olds. Boys displayed rich imagination and originality in the quality of their answers as compared to the girls. )

In their review of a considerable literature, Broverman, et al (1968) cover a number of bio-chemical studies that can be interpreted as indicating the physiological factors underlying the cognitive sex differences, and they conclude that these difference are related (at least in part) to the sex steroid hormones. These hormones have effects on the neural processes of activation and inhibition.

According to Broverman, et al. (1968) the behaviours in which males are superior to females are those involving an inhibition or delay of initial response techniques to the more obvious aspect of the stimulus in favour of less obvious attributes. Males are also better in those behaviours involving extensive mediation of high processes in contrast to those requiring automatic



or reflexive stimulus, response connections. They also claim males to be superior in tasks requiring novel solutions as opposed to those involving speed or accuracy of repetitive responses (Nash, 1970).

The differences in creative performance between boys and girls can be attributed to the differential treatment accorded to boys and girls in our culture. Girls are generally brought up with greater restraints and on ~~strict~~ codes of behaviour than are boys. They are given relatively less freedom and are provided with less opportunities for exploration. On the other hand, boys are brought up in a more permissive atmosphere and accorded more liberal treatment. The treatment ~~meted~~ out to girls represses creativity in them. It may also be that the girls, are progressively weaned away from creative behaviour by societal expectations for the appropriate fulfillment of the female role. Girls are expected and are also so brought up to be submissive, docile and dependent. They are not encouraged to hold independent and individualistic views. Greater stress is laid, for girls than for boys on conformity. This strong prevalence among almost all Indian families to lay great emphasis on dependency and conformity for girls, inhibits the development of creativity in them.

In the Indian context, sex, differentiation begins from birth where boys are given more opportunities for acquiring a better future. They receive more freedom attention and care than do girls. In Indian conditions, at least, marriage is the only choice for girls and education serves a two



fold purpose namely to keep them occupied till their marriage and secondly, in order to obtain an eligible husband. To aspire, for a higher professional career is rarely the chief aim in a girl's <sup>f</sup>like unlike that of her male counterpart. The present result with respect to creativity is to be appreciated in this context.

In tradition bound Indian society, girls are expected to be more orderly and disciplined than boys. As a result they may come to evince greater interest in orderly structured and balanced aspects of the environment than boys. The inclination on the part of girls may have brought about significant sex difference in the present sample.

In our Indian Society, girls of the older age group (starting from elementary school period) are traditionally not expected to <sup>o</sup>ostentatiously manifest their emotions particularly ~~through~~ or through display of innovative/<sup>original</sup> ideas, thoughts, feelings etc. They are supposed to curb their sense of humour and the over display of the same. The traditionally found inculcation of systematic and regimental attitudes among girls may have brought about this difference in creativity. Viewed in this context the present results appear tenable.

The present study's contention that boys are more creative than girls, finds support in the findings of Torrance (1963), Arasten (1968) and Strauss and Strauss (1966), Jacqueline and Murray (1968), Bajard (1971)



Torrance (1972), Paterson (1980), Karnes (1980), Dharmangandan (1980), Shukla (1982) and Saijadi-Bafghi (1986). However, the present finding contradicts the following studies: Wallach and Kogan (1965), Yamamoto and Chimbidis (1966) Warren and Luria (1972), Haplin, et.al (1973) Rodringers and Soriam (1983) which had reported either no sex differences or superiority of the girls over boys.

#### Effect of Age

It may be seen that among the gifted elementary school boys, 9-10 years olds displayed a greater gain in their creativity scores ( $\bar{X}=77.3$ ) followed by 11-12 ( $\bar{X}=57.8$ ) and 7-8 year olds ( $\bar{X}=54.7$ ). The same trend was observed among 9-10 year olds ( $\bar{X}=48.0$ ) followed by 11-12 year olds ( $\bar{X}=40.1$ ) and then 7-8 year olds ( $\bar{X}=5.3$ ) gifted elementary school girls. Hence, it may be concluded that age has a definite bearing on the gifted children's gain in creativity scores after their exposure to enrichment programme. Gifted elementary school children of 9-10 years fared well and their creativity gain levels were quite high as compared to other age groups.

The results correspond with the general theoretical premise namely that the age of ten years is a time of broadening interests and learning to make social contacts. The ten-year-olds learns the meaning of personal independence. He is an individual with definite personality characteristics of his own or her own. Both boys and girls are interested in expanding their



knowledge of the world around them. Self-motivation is the cardinal characteristic of the ten year olds, where by he is impelled by inner forces to spread his knowledge into the world of history, leading to a psychic expansion of the inner self. Age ten is an important year in the intellectual and social development of the child whereby both boys and girls begin to reach ahead towards their teen years and interests. Hence exposure to similar forces in the environment, the pattern of development native to the ten-year olds boys and girls and the absence of the influence of constitutions factors, may have resulted in the presence of varied interests, and high higher levels of creative thinking at this age. As they pass on to the next age level, though there is an improvement in the creativity gain scores, it is less than that of the middle age group due to their pre-occupation with school and school related tasks.

The present results may be appreciated <sup>if</sup> viewed in the context of the period of the child's development. Nine years is the period of development of skill in the three R's. Children of nine years are avid readers and they begin to relate themselves not only to their immediate environment but to their school, their neighbourhood and the world. In this process, children of this age begin to gather information and evince keen interest in events around them. They start to understand complex ideas and processes; their powers for accomplishment are matched by a new



resourcefulness and stability. Boys and girls are about equally interested in anything and everything that is new and strange. As children grow older, maturity takes place in all areas of development, one of which is intellectual development. Children appear to break away from the traditional values which were taught to them in their early years. They prefer to exercise the new found freedom of thought and expression in their own way. Hence, the variation in the present results from those observed in the younger age groups by other researchers.

The present results are in line with those of Johnson and Khatena (1975), Milgram and Norman (1977), Tennebaum (1978), Kerlin and Johnson (1979), Westerbund (1980), Milgram and Rabkin (1980), Gasiorowska (1982), Borzym Irena (1983), Smith, et al. (1985), Bekey and Michael (1986-87) but do not support the findings of Johnson (1975) and Karnes, et al. (1981).

Effect of Ordinal Position on the Creativity Gain Scores of the Gifted

Who had Undergone Enrichment Programme:

The present study emphasized the role of the ordinal position in the creativity gain scores of the gifted boys and girls. In regard to gifted boys, first borns gained the maximum creativity score after the exposure (65.1) followed by only (58.3) and the last-born (24.2). The mean differences between pre and post test creativity scores for all the three birth orders were found to be significant.



Presence of significant bearing of ordinal position on the creativity gain scores of gifted girls was also found. The last borns seemed to have gained the maximum creativity score (43.5) followed by only (42.0) and first borns (38.0). The study disclosed that ordinal positions had a significant effect on the mean creativity gain scores of gifted girls.

It has been proposed that family configuration, that is the order, number, and spacing of children and the number of parents in the home, is associated with intellectual performance (Zajonc and Markus, 1975; Zajonc, 1976). Children born early in the birth order generally have higher IQs than later born children. However, wide spacing in the intervals between siblings has been found to eliminate the adverse effects of later born. It has been suggested that the intellectual environment in a family changes with different family configurations. The cognitive levels of the family can be viewed as being the average of the cognitive levels of each family members. Early born children are likely to experience more individual contacts with parents, especially in the early years. Parents have a limited amount of time available for their children. It follows that as the family increases in size, each child will have less parental time spent in such things as reading, playing and individual fact-to-face interactions (Hetherington, and Parke, 1979).



The results of a well-controlled study conducted in the Netherlands are noteworthy, however (Belmont and Marolla, 1973). The investigators examined the relationship between intellectual competence and family size and birth order for almost four hundred thousand men. They found that as scores on a non-verbal measure of intelligence decreased, family size and birth order become progressively larger. First borns always scored higher than did second borns, second born scored higher than the third borns, and so on, regardless of family size. Furthermore, these effects were found for the three social classes examined. The authors suggest that perhaps mothers became "less effective producers" with an increasing member or that parents pay less attention to the child as family size increases (Liebert, Poulos and Marmor, 1979).

The above findings correspond to the studies of Roe (1953), Wereberg and Springer (1961), Goertzel (1962), Atlas (1965), Raychaudhuri (1965), Helson (1969) Lunner berg (1968), Lichtenwalner and Maxwell (1969), Eiseman and Schussel (1970), Maltzounis (1978), Wilks and Thompson (1979) Comean (1980) Runcio and Bahbeda (1987).

#### Relationship Between Intelligence and Creativity Levels of Elementary School

##### Gifted Children:

The coefficient of correlation between intelligence quotients and creativity gain scores was carried out for both sexes. The general trend



of it indicate a positive relations between these two variables for all age groups (boys and girls). However, gifted girls obtained relatively higher correlation coefficient than the gifted boys.

This finding is in line with these of Cropley and Maslany (1969), Maltalia (1970), Pfeiffer (1971), Richmond (1971), Cropley (1972), Shiblya, et al. (1973), Ogilvis (1974), Mabi (1979), Doutriaux (1980), Sternberg (1982).

Contributions to Conceptual Base:

The findings of this study seem consistent with those of others concerned with creativity. One approach that commands greater acceptability is the associative conception. Mednick (1962) posited the associative conception of creativity by pursuing the lead taken by Maltzman and his experimental approach. Analysis of the introspective account of highly creative persons led Mednick (1962) to define creative thinking as "..... the forming of associative elements into new combinations which either meet specified requirements or are in some way useful". According to him there are three conditions that facilitate creative problem solving, they are serendipity, similarity and mediation. The present study seems to support Mednick's analysis of creativity. The evidence supports that an orderly developmental progression takes place in gaining creativity scores due to enrichment. Young children appear to develop creative abilities which allow them to self-direct the integration and application of knowledge and strategies more productivity.



Following the lead given by Mednick (1962), Wallach and Kogan (1965) came to the conclusion that the creative process consists of the ability to generate under various circumstances, associational responses that are many and that are unique. They proposed a gradient theory of creativity, in which the gradient of potential responses is shallow for a less creative individual. The time/or evaluation pressure prevents the highly creative individual from evoking his unique or creative responses which will be evoked only after he has produced, the relatively common and stereotyped responses, that all people will tend to give initially, irrespective of their potential level of creativity.

Wallach and Kogan (1965) found a good correlation between the fluency score and the uniqueness score in their study and Pankove and Kogan (1968) found that the fluency scores alone would be an adequate criterion of creativity. In other words, for valid measures of creativity it appears that one can safely rely on the measure of fluency or number without concern for uniqueness. Hence, in this study, the criterion of fluency or number alone is used.

#### IMPLICATIONS:

This study convincingly demonstrates that the enrichment had sufficient impact on the creativity scores of academically gifted elementary school students. It also shows that, as Mackinnon (1978) suggested, heavy



reliance on intelligence is unreliable for identification of learners for special programs and overlooks many. Disregarding creative abilities will limit a fuller understanding of individual differences in performance. All children of high intelligence did not necessarily have a high degree of creativity. All children of high creativity did not necessarily have a high degree of intelligence. There were, numerous instances in which children were both highly intelligent and creative.

The data resulting from this study suggest that the educated nurturance of creating abilities should not be ignored when considering educational programming for the development of talent. Especially in programs for the elementary school children, nurturance should include a concern for the development of creative behaviours.

In India, the National Policy of Education (1986) has also started special educational provision for the gifted/talented. Institution like the NCERT and other voluntary organizations, have started special cells for working for the programme of the exceptional children. But this is in the begining stage and a lot of effort must be put in order to enhance these children to blossom their potentialities. Thus parental involvement and the exposure of children to experts within the community for enrichment are extremely important aspects, of the enrichment programme.



Differences in means of creativity from 7-12 year of age support the suggestion that creative potential may be either suppressed or enhanced very early life. Rather than control and confine the natural spontaneity of young children, the educational setting should promote the use of creative strategies to enhance and assist children in organizing and systematizing their natural creative abilities.

Elementary school children can make excellent use of opportunities for investigation. Creative techniques such as synectics and brainstorming and also a variety other methods can assist teachers and parents in achieving this goal. Children must be permitted to encounter creatively, to feel, smell, look, tap and sense the new in every day way possible. They must discover as well as listen and watch. As pointed out by Morgan (1971) children must be encouraged and guided to look at things in many different ways. Children need props and resources for manipulation to warm them up psychologically, and to provide the means for carrying out their ideas. Guided fantasy, role-playing, story telling, drawing and the like should be considered as normal and productive aspects of children's thinking. These activities will provide the foundation for sound problem solving and decision making.



### SUMMARY AND CONCLUSION

The main aim of the present study was to design, implement and determine the impact of enrichment programme on the creativity levels of 7-12 year old gifted children. It also striver to assess the influence of sex, age, and ordinal position on the creativity gain scores of the gifted who were exposed to enrichment programme.

SAMPLE: The total sample consisted of 93 gifted children (20 in age group 7-8 years), (30 in age group 9-10 years) and (20 in age group 11-12 years)

TOOLS USED: 1. Weschler's Intelligence Scale for Children to assess intelligence 2. The Wallach and Kogan's Battery of Creativity Instruments adapted by parametet to test creativity and 3. Enrichment Activities.

The gifted children who were identified by the WISC test, were assessed on their creativity levels by means of the Wallach-Kogan Battery of Creativity Assessment. This constituted their pre-test scores. The Enrichment Programme with its set of clearly defined goals, objectives and into variants was conducted for a period of 45 days. The programme was planned in order to challenge the imagination and stimulate the gifted after 45 days, the gifted were once again the pre test method. This constituted the post-test scores. Therefore the improvement in creativity scores prior to and after the enrichment was determined.



The study revealed that:-

1. The enrichment had sufficient improvement in the creativity levels of gifted students both boys and girls
2. There was significant impact of sex differences on the creativity gain scores of gifted students both boys and girls
3. There was significant impact of different age levels 7-12 years on the creativity gain scores of gifted students both boys and girls
4. The effect of ordinal positions on the creativity gain scores of gifted students both boys and girls was also significant.
5. There was significant correlation between IQ scores and creativity gain scores of gifted students both boys and girls
6. There was no impact of ordinal positions on the IQ levels of gifted boys and girls
7. There was no impact of age levels on the IQ levels of gifted boys and girls

CONCLUSION:

The present investigation showed that the enrichment had sufficient impact on the creativity scores of academically gifted elementary school students. The study also showed that age levels, sex and ordinal positions significantly affected the mean creativity gain levels of the gifted students.

POSSIBILITIES FOR FURTHER RESEARCH:

1. Enrichment can be offered right from the preschool levels.
2. To make the program more valid and significant, time span could be increased
3. Economic status of gifted children can also be considered.



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